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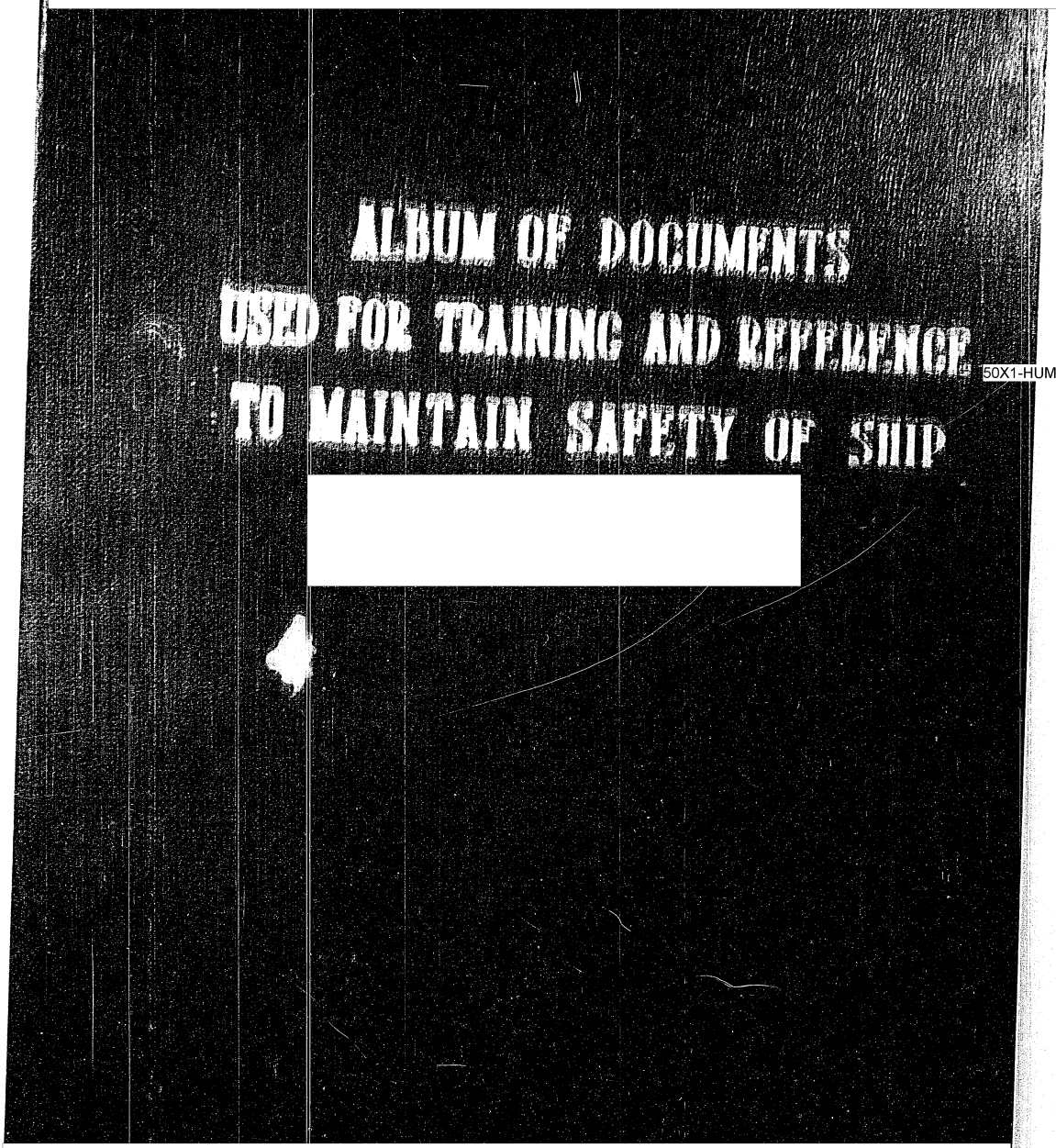

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All the documents pertaining to the maintenance of safety of ship are based upon average values of displacement and coordinates of the centre of gravity:

standard displacement $D_{st.}$=1,000 t.; Z_g=3.72 m; X_g=-1.99 m

normal displacement $D_{n.}$=1,070 t.; Z_g=3.53 m; X_g=-1.97 m

full displacement $D_{f.}$=1,143 t.; Z_g=3.41 m; X_g=-2.45 m

The metacentric heights measure:

$h_{st.}$=0.70 m; $h_{n.}$=0.75 m; $h_{f.}$=0.75 m

The documents relating to the ship's stability are generally applicable to all the ships of project 159 AE provided that the difference between the actual value of stability factors at standard and normal displacements and the data given below is within minus 5 to plus 10% :

$D_{st.} h_{st.}$ = 1,000 x 0.70 = 700 t.m

$D_{n.} h_{n.}$ = 1,070 x 0.75 = 802 t.m

If large alterations of stability factors are involved due to an overhaul or modification of the ship, the data given below in the form of a tabulated statement shall be revised.

The present "Album of Documents Used for Practical Reference to Maintain Safety of Ship" includes:

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1. Part I. General information on ship's main characteristics and her power of survival (table containing information on ship's main particulars and characteristics for normal displacement; diagram of watertight bulkheads; data on strength of watertight bulkheads; diagram showing arrangement of doors, covers and manholes; hydrostatic curves; curves of areas of sections; cross curves of stability).

2. Part II. Tables containing information on ship's characteristics for dangerous cases of flooding.

These tables are set out for some cases of hazardous flooding of ship, including cases giving information on the presence of leak water in compartments adjacent to the flooded [illegible] with [illegible] off forebody/afterbody extremity, [illegible] adjacent compartments flooded.

Diagrams of statical stability for the ship in undamaged and damaged condition are plotted for convenience against conventional righting arms (moments of statical stability relating to normal displacement of a damaged ship).

The values of the initial transverse and longitudinal metacentric heights are given for a ship with no list; and the values of the moment to change heel 1 deg. and moment to change trim 1 cm, for a damaged ship in a state of equilibrium.

3. Part III. Tables containing characteristics of watertight compartments.

In working out the tables, normal displacement of the ship is assumed as design load.

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For the compartments located below the design waterline the data given in columns 4-9 and 15-16 hold good for complete flooding of the compartments, and in the case of compartments crossed by the design waterline the data are given in the form of a fraction: data given in the numerator hold for flooding compartments up to the design waterline, and that in the denominator, for complete flooding of the compartments.

Flooding and draining time indicated is given for the full volume of the compartment.

In the case of engine rooms the data set out hold true for flooding up to the design waterline.

The values of volumes and lost waterplanes as well as values of moments to correspond and moments of inertia are calculated with due regard to flooding and permeability factors.

In columns 7,11 and 13 are given values of moments about the plane of the main frame which passes through the centre of gravity of the design waterplane.

In columns 4 and 5 are entered alterations in list and trim incurred due to flooding of the compartment in question. The values of list to starboard and trim by the bow are marked with sign "+".

Appended to the tables containing characteristics of the watertight compartments is a data sheet (with an example of calculating trim and stability of ship in damaged condition through applying data on watertight compartments) for calculating trim and stability of the damaged ship by the ship's personnel.

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4. Part IV. Directions in fuel admission and using up.

These directions specify the most efficient method of fuel admission on board ship and using it up in order to retain the ship's stability and ensure maximum endurance of the system supplying fuel to the engines.

Also, these directions ascertain the sequence of ballasting the fuel tanks with water to recover stability of the ship in severe weather conditions.

5. Part V. Reference data on systems, technical means and damage repair equipment.

Reference data are comprised of:

main characteristics of flooding and drainage appliances;
diagrams showing arrangement of the following systems:
- ship's fire main system;
- ballast and anti-roll systems;
- bilge system;
- salvage system;
- flooding system;
- sprinkling system;
- hull ventilation system;
- hold signalling system;

diagram showing arrangement of openings in hull;
diagram showing arrangement of life-saving appliances and damage repair equipment.

The items Nos. of valves and sockets used in the diagrams of the present "Album" are in compliance with those stated in pertinent descriptions and service instructions.

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Symbols used in the text and diagrams:

l_1 - (1) righting arms;
(2) draught;

V_1 - displacement, volume of, less appendages;

V - displacement, volume of, appendages included;

S - waterplane area;

ρ - transverse metacentric radius;

R - longitudinal metacentric radius;

x_f - longitudinal centre of flotation (of waterplane area S) counting from amidships;

I_x - central moment of inertia of the area S, for roll;

I_y - central moment of inertia of the area S, for pitch;

z_b - transverse centre of buoyancy from base;

x_b - longitudinal centre of buoyancy from amidship section;

z_m - transverse metacentre above centre of buoyancy;

α - coefficient of fineness of waterline;

β - maximum transverse section coefficient;

δ - coefficient of fullness of displacement.

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PART I

GENERAL INFORMATION ON SHIP'S MAIN CHARACTERISTICS AND HER POWER OF SURVIVAL

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Main particulars and characteristics of ship at normal displacement

Name	Symbol	Numerical value	Unit
Length [illegible] waterline	L	78.00	m
[illegible] waterline	B	8.94	m
[illegible] bulwark included bulwark excluded	D_F	9.50 8.50	m
[illegible] body	H_A	9.80	m
[illegible] s	H_M	5.50	m
[illegible], normal	Δ	1,470	t
[illegible]	T_M	2.80	m
[illegible] forward	T_F	2.87	m
[illegible]	T_A	2.74	m
[illegible] transverse metacentric height	h	0.75	m
[illegible] stability factor	Δh	[illegible]	t.m
[illegible] to change heel 1 deg.	$\bar{m}$	14.0	$\frac{t.m}{deg.}$
[illegible] transverse metacentric height	H	183	m
[illegible] stability factor	ΔH	196,000	t.m
[illegible] to change trim 1 cm	$\bar{M}$	25.1	$\frac{t.m}{cm}$
Reserve buoyancy	λ	1,910	cu.m
Waterplane area	S_O	544	sq.m
Longitudinal centre of flotation	X_f	-5.79	m
Co-ordinates of main frame			
Distance from fore perpendicular	$L_F = \frac{L}{2} - X_f$	44.79	m
Distance from aft perpendicular	$L_A = \frac{L}{2} + X_f$	33.21	m

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[illegible] of [illegible] bulk-head	Height of bulkhead extreme highest point above moulded base	Bulk-head mean width (de-signed)	Pressure head sus-tained with no way on (from moulded base, m w.g.)	Permissible speed of ship with forebody extremity broken off
fr.	m	m	m	knots
10	8.00	2.70	9.20	10
22	7.40	4.90	8.10	10
36	6.62	6.85	6.90	-
56	5.73	8.55	5.73	-
75	5.62	8.88	5.62	-
81	5.60	8.92	5.60	-
96	5.45	8.70	5.70	-
115	5.60	8.15	6.10	-
121	5.68	8.05	6.20	-

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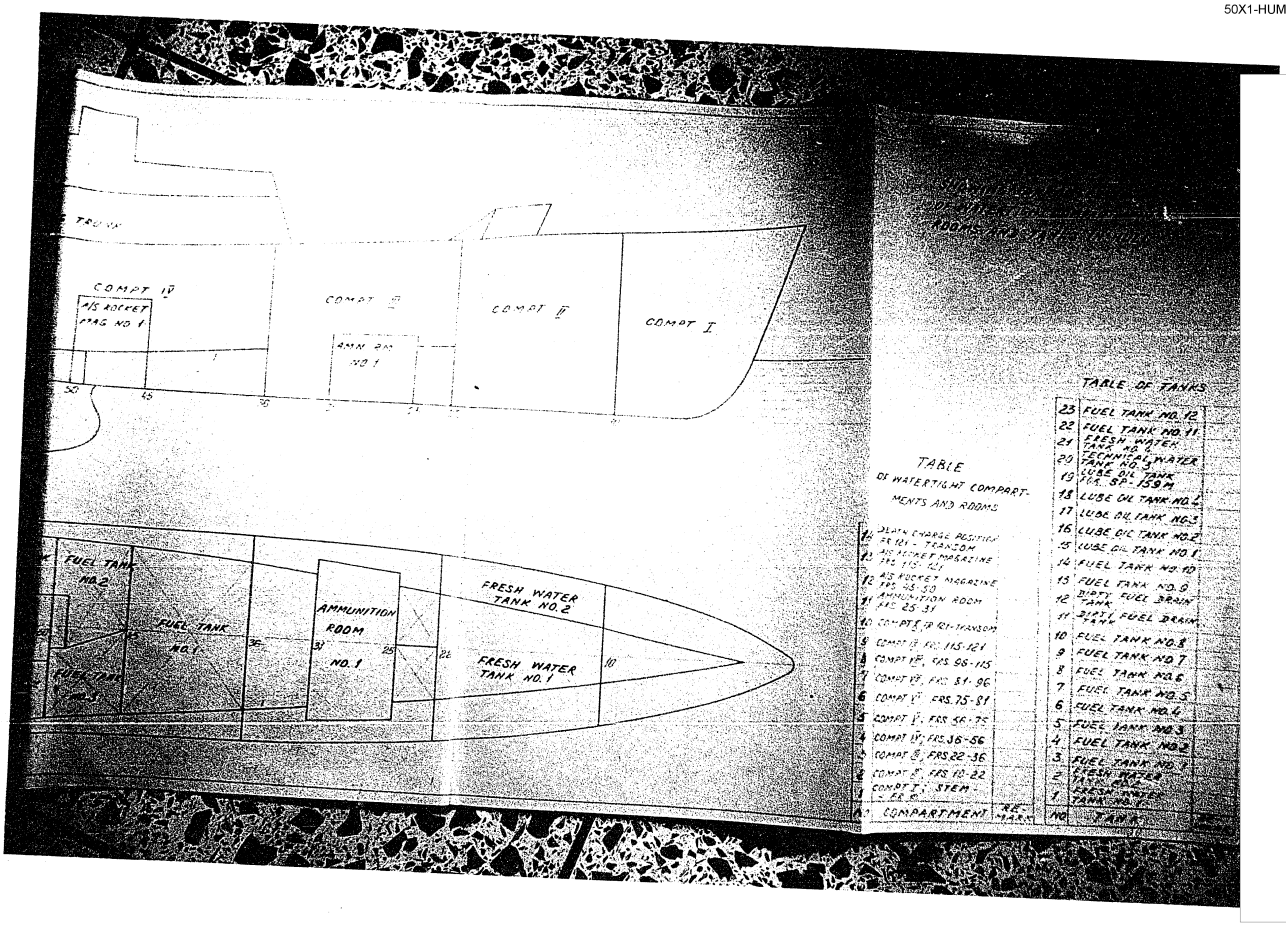
COMPT IV
A/S ROFFET PROJ. NO. 1
COMPT III
AMM. MAG. NO. 1
COMPT II
COMPT I
FUEL TANK NO. 2
FUEL TANK NO. 1
FUEL TANK NO. 3
AMMUNITION ROOM NO. 1
FRESH WATER TANK NO. 2
FRESH WATER TANK NO. 1
TABLE OF WATERTIGHT COMPARTMENTS AND ROOMS
COMPARTMENT
TABLE OF TANKS
FUEL TANK NO. 10
FUEL TANK NO. 11
FRESH WATER TANK NO. 2
TECHNICAL WATER TANK NO. 3
LUBE OIL TANK U.A. SP-159M
LUBE OIL TANK NO. 4
LUBE OIL TANK NO. 3
LUBE OIL TANK NO. 2
LUBE OIL TANK NO. 1
FUEL TANK NO. 10
FUEL TANK NO. 9
DIRTY FUEL DRAIN TANK
DIRTY FUEL DRAIN TANK
FUEL TANK NO. 8
FUEL TANK NO. 7
FUEL TANK NO. 6
FUEL TANK NO. 5
FUEL TANK NO. 4
FUEL TANK NO. 3
FUEL TANK NO. 2
FUEL TANK NO. 1
FRESH WATER TANK NO. 1
AFTER PEAK TANK NO. 1

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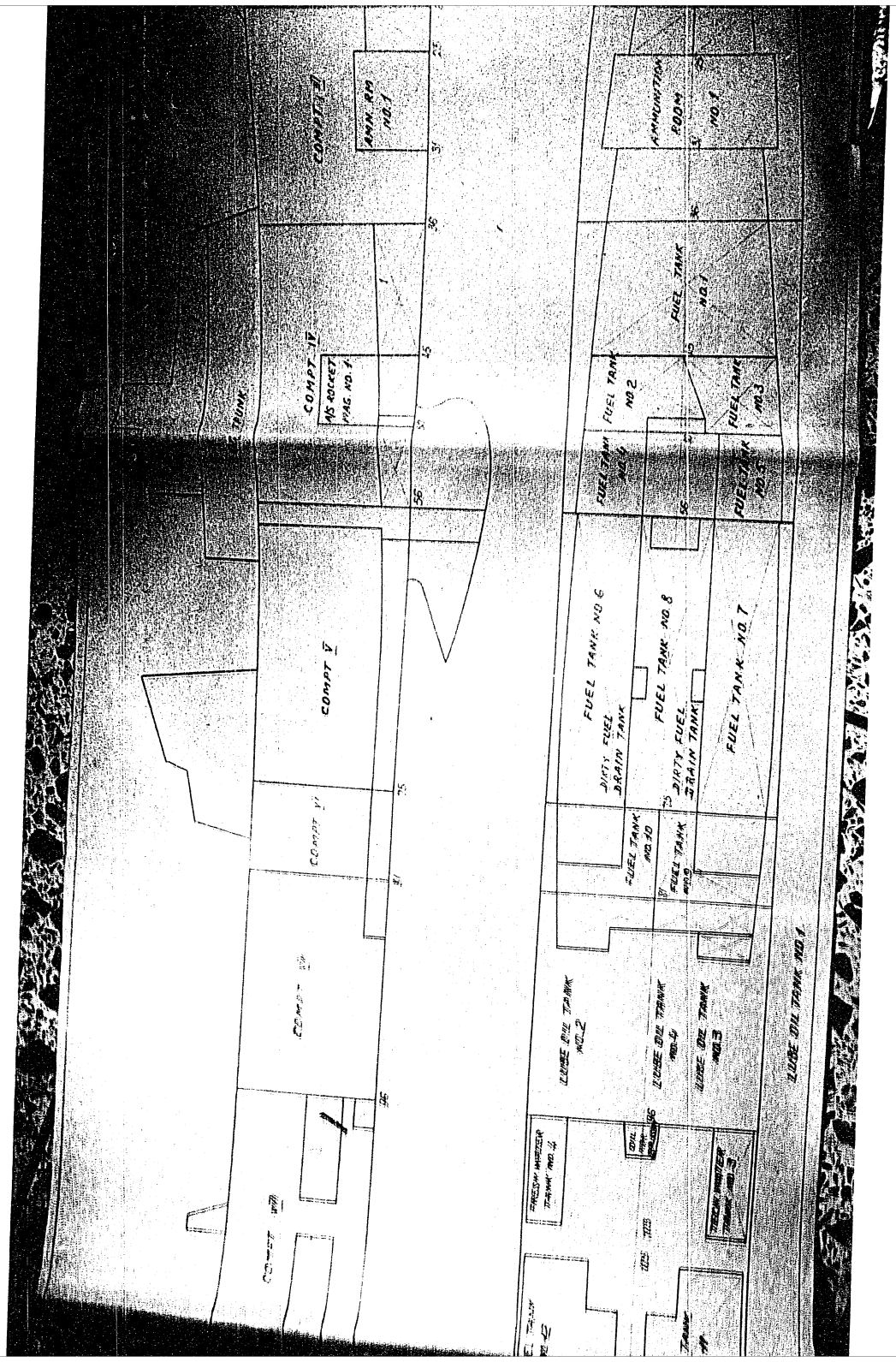
AMM RM NO 1
COMPT IV
AMMUNITION ROOM NO 1
FUEL TANK NO 1
FUEL TANK NO 2
FUEL TANK NO 3
FUEL TANK NO 4
FUEL TANK NO 5
FUEL TANK NO 6
FUEL TANK NO 7
FUEL TANK NO 8
FUEL TANK NO 9
FUEL TANK NO 10
DIRTY FUEL DRAIN TANK
DIRTY FUEL DRAIN TANK
LUBE OIL TANK NO 1
LUBE OIL TANK NO 2
LUBE OIL TANK NO 3
LUBE OIL TANK NO 4
FRESH WATER TANK NO 3
FRESH WATER TANK NO 4
COMPT V
COMPT VI

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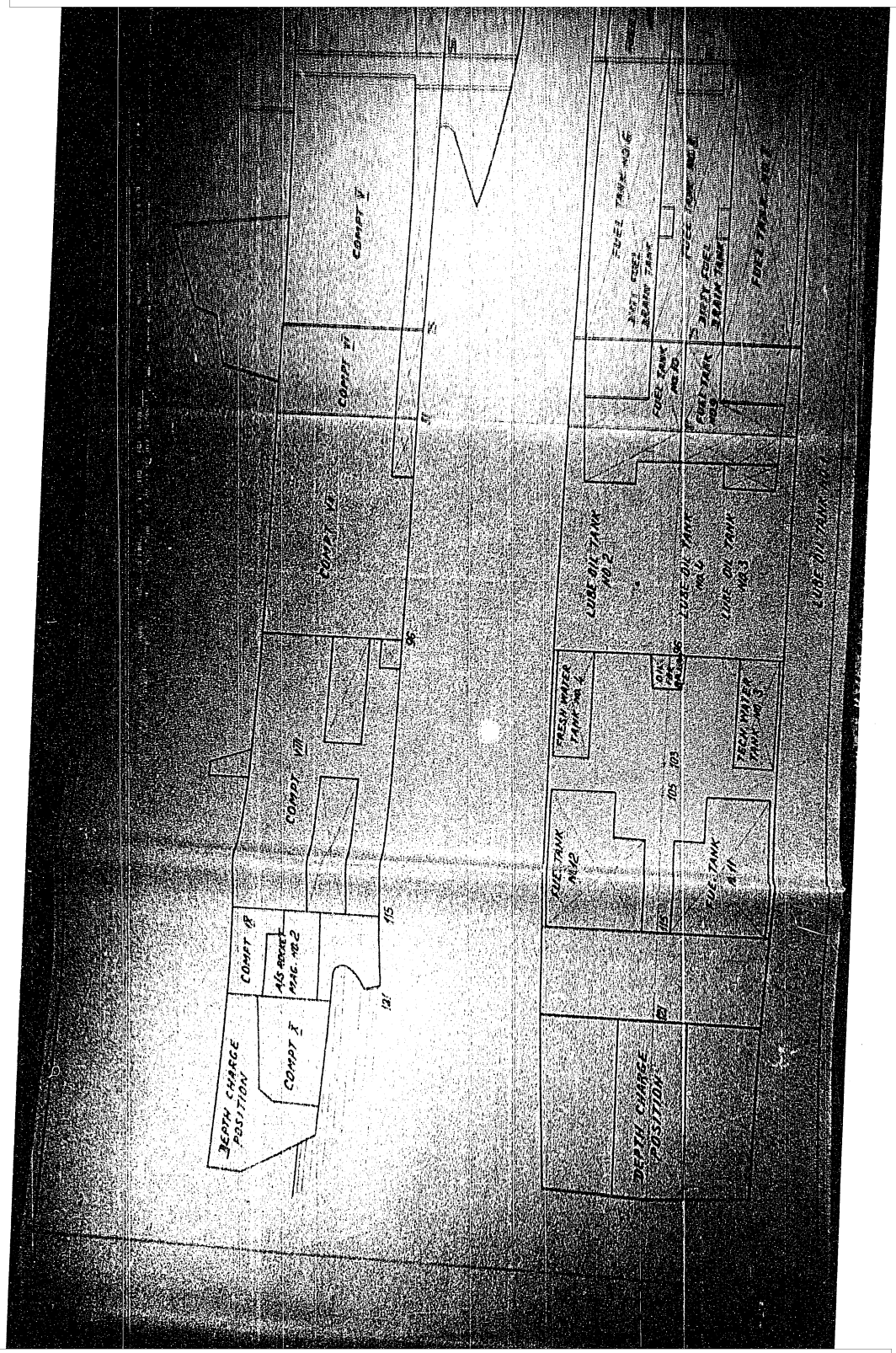

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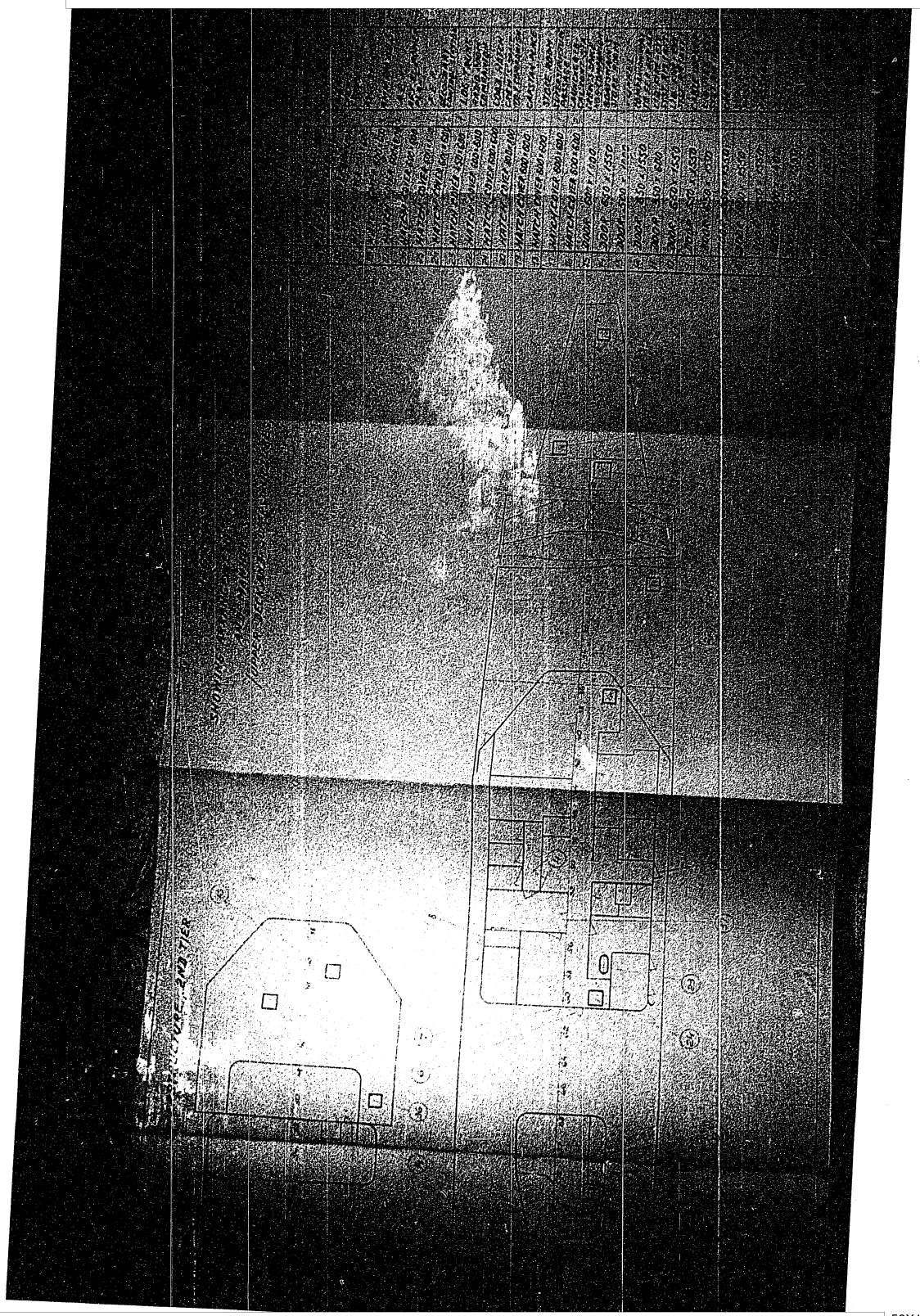

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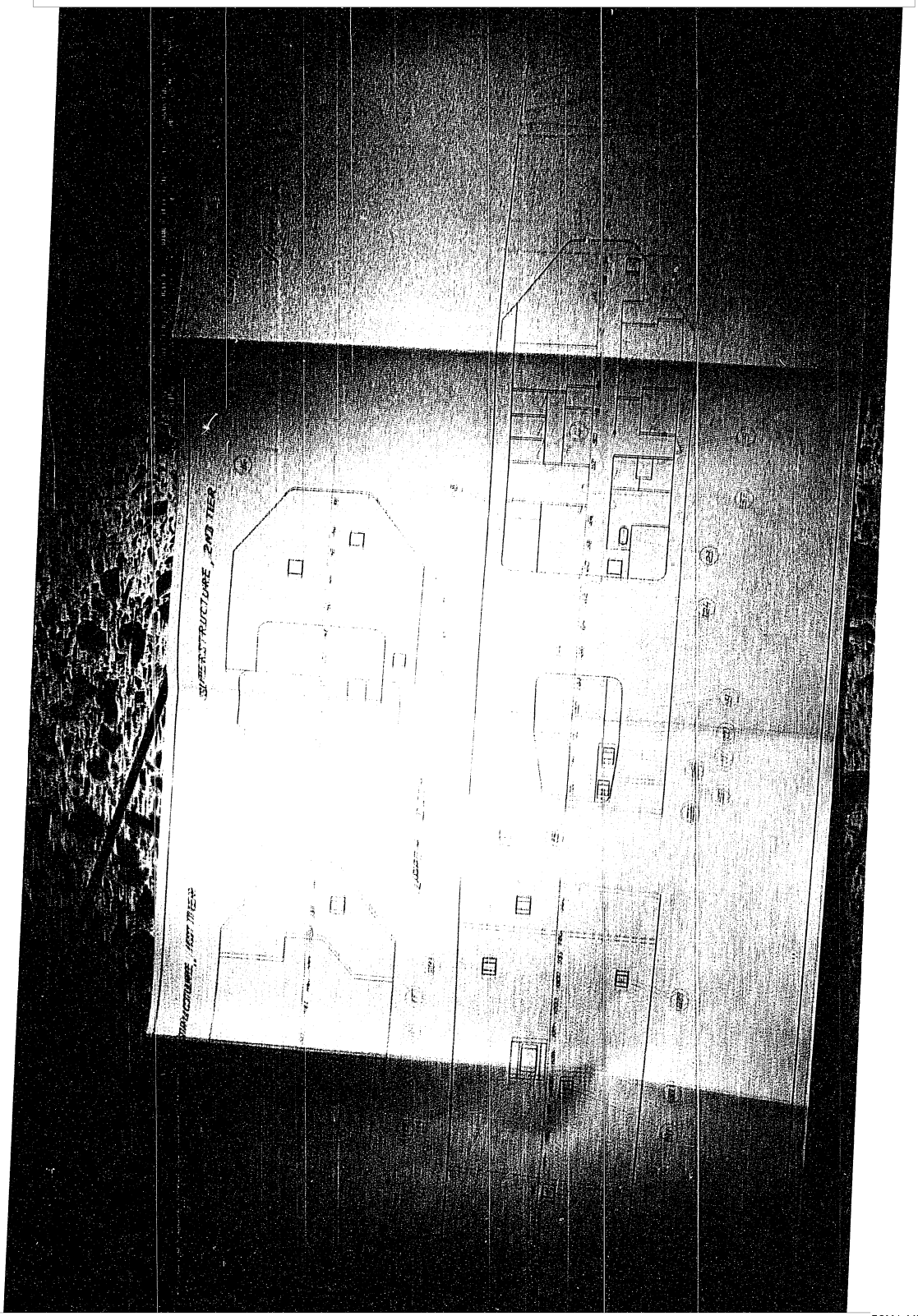

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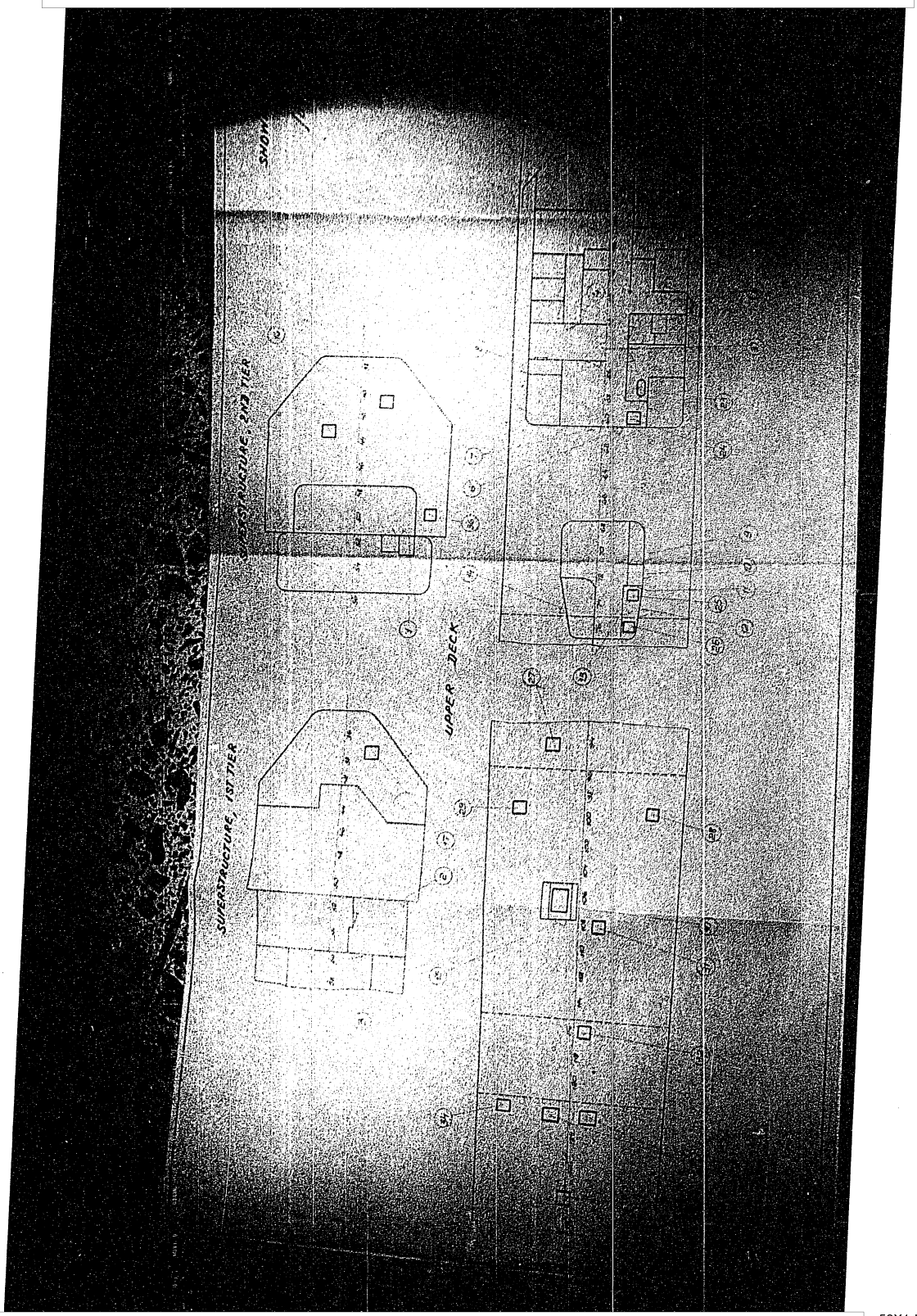

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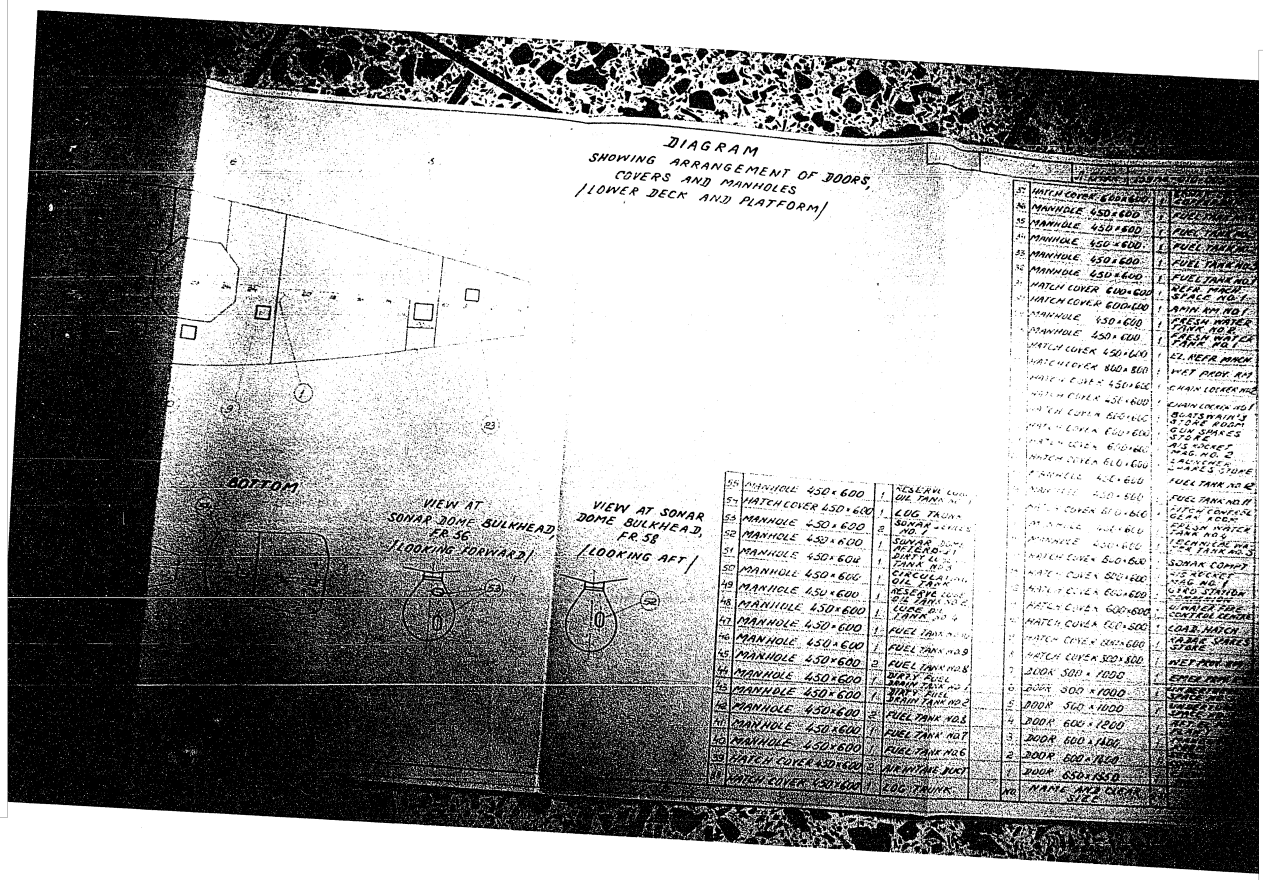

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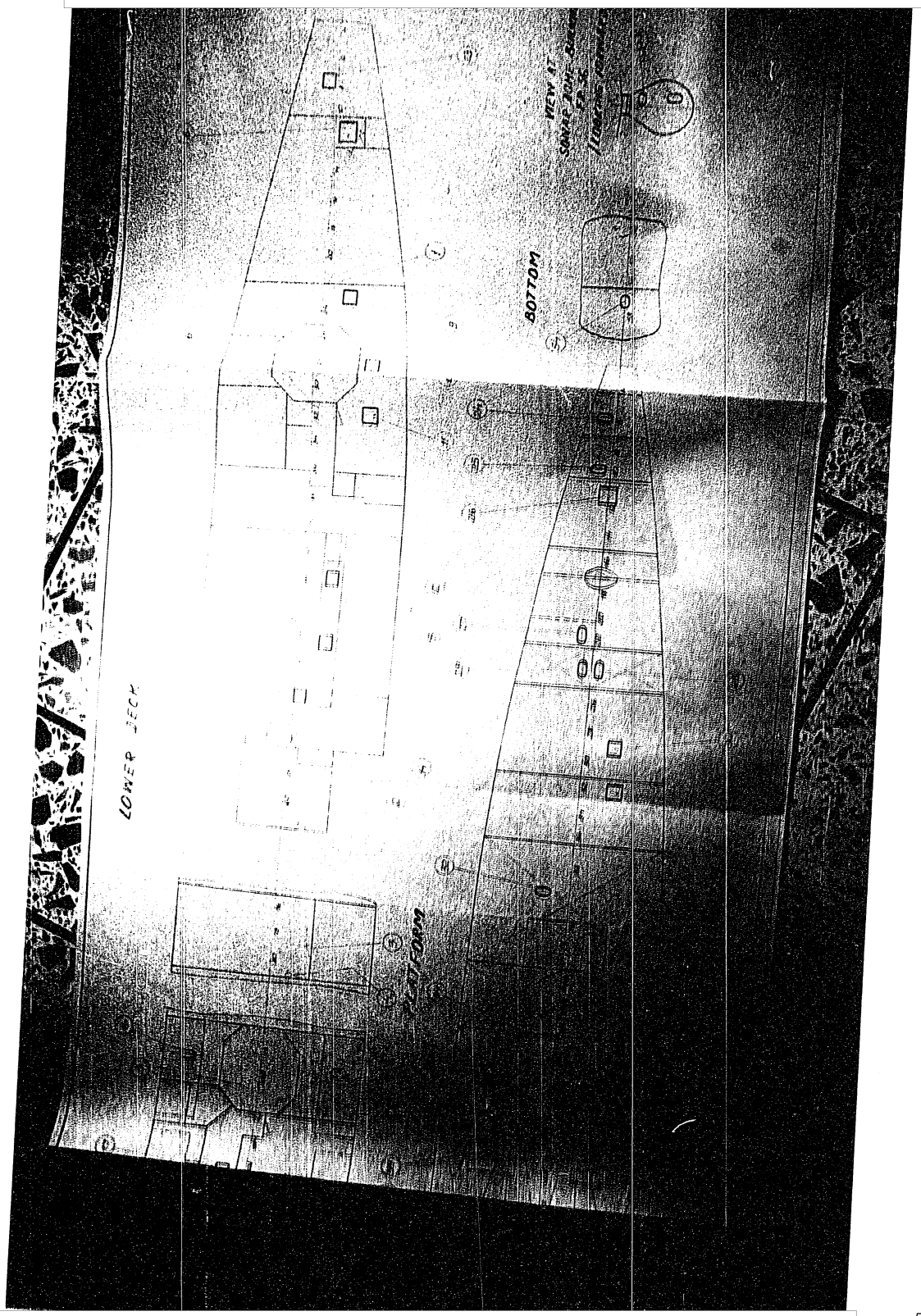

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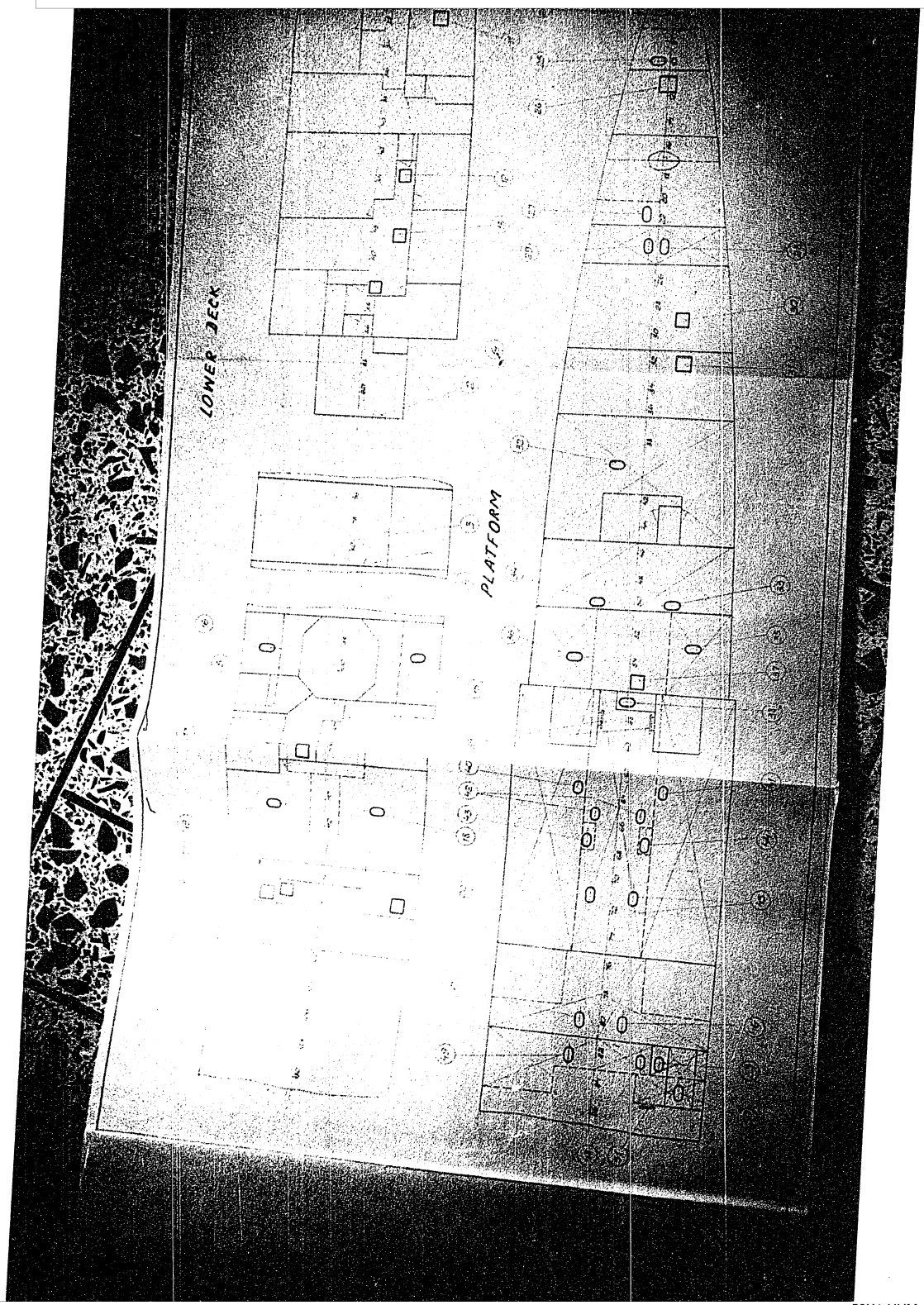

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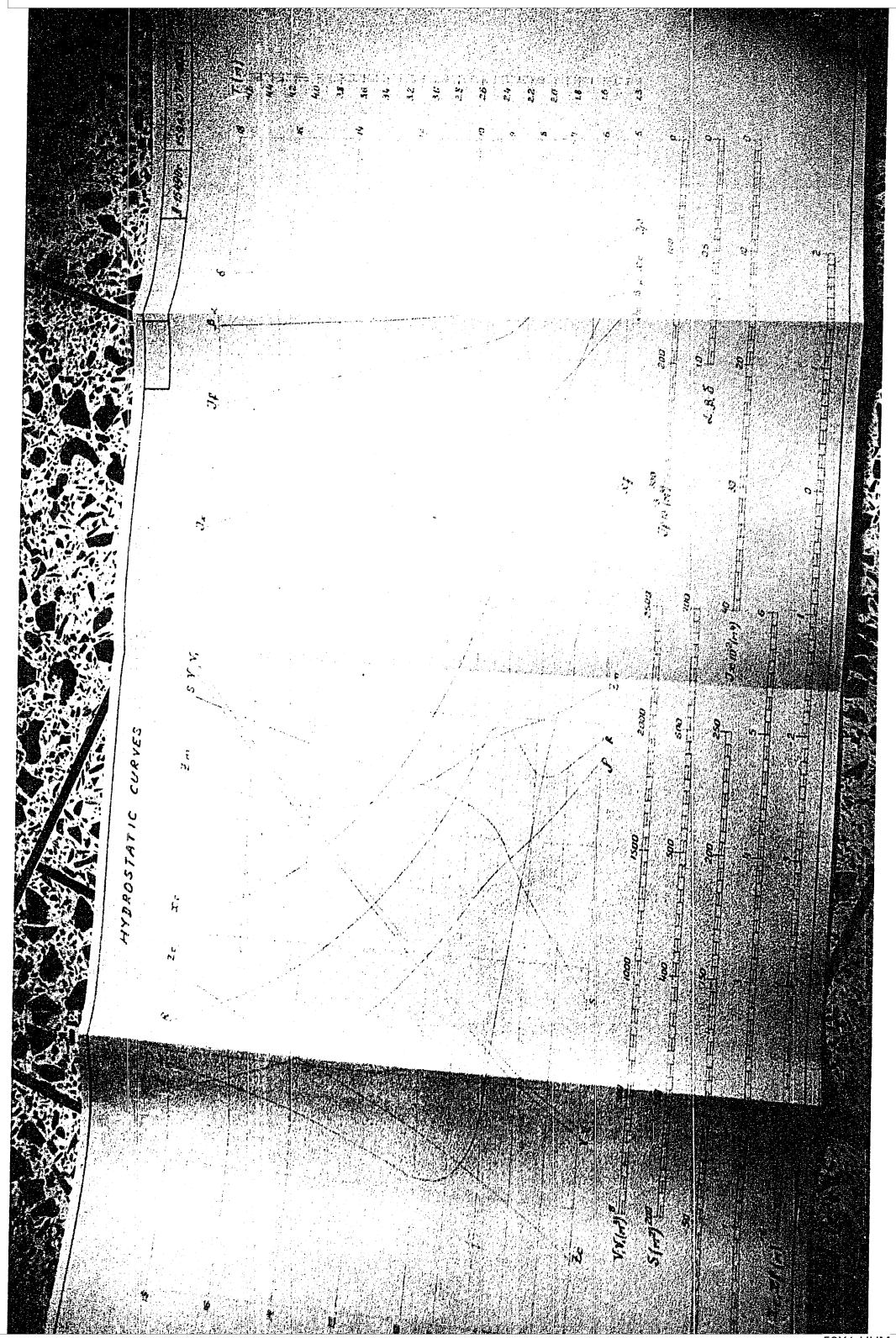

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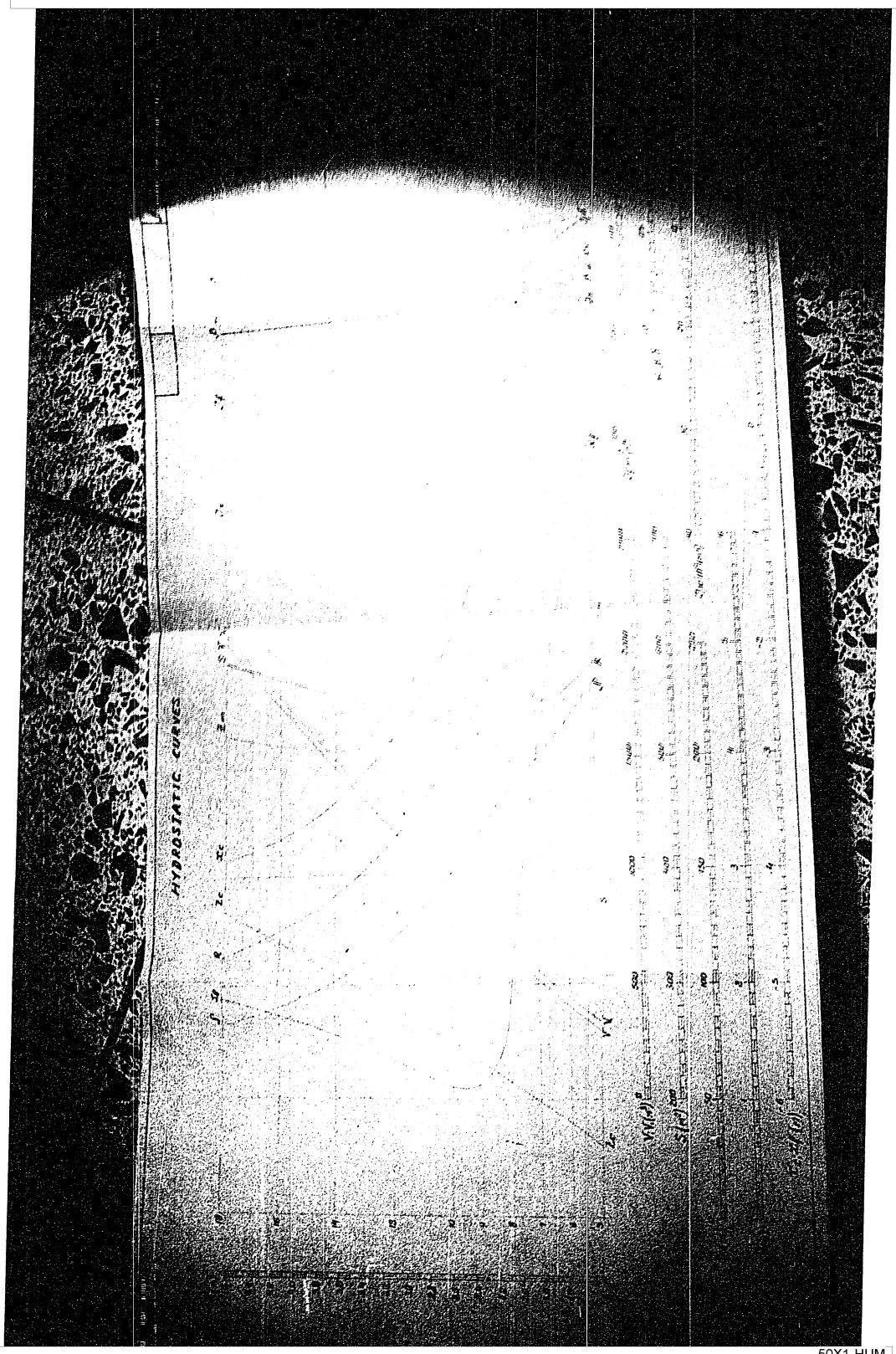

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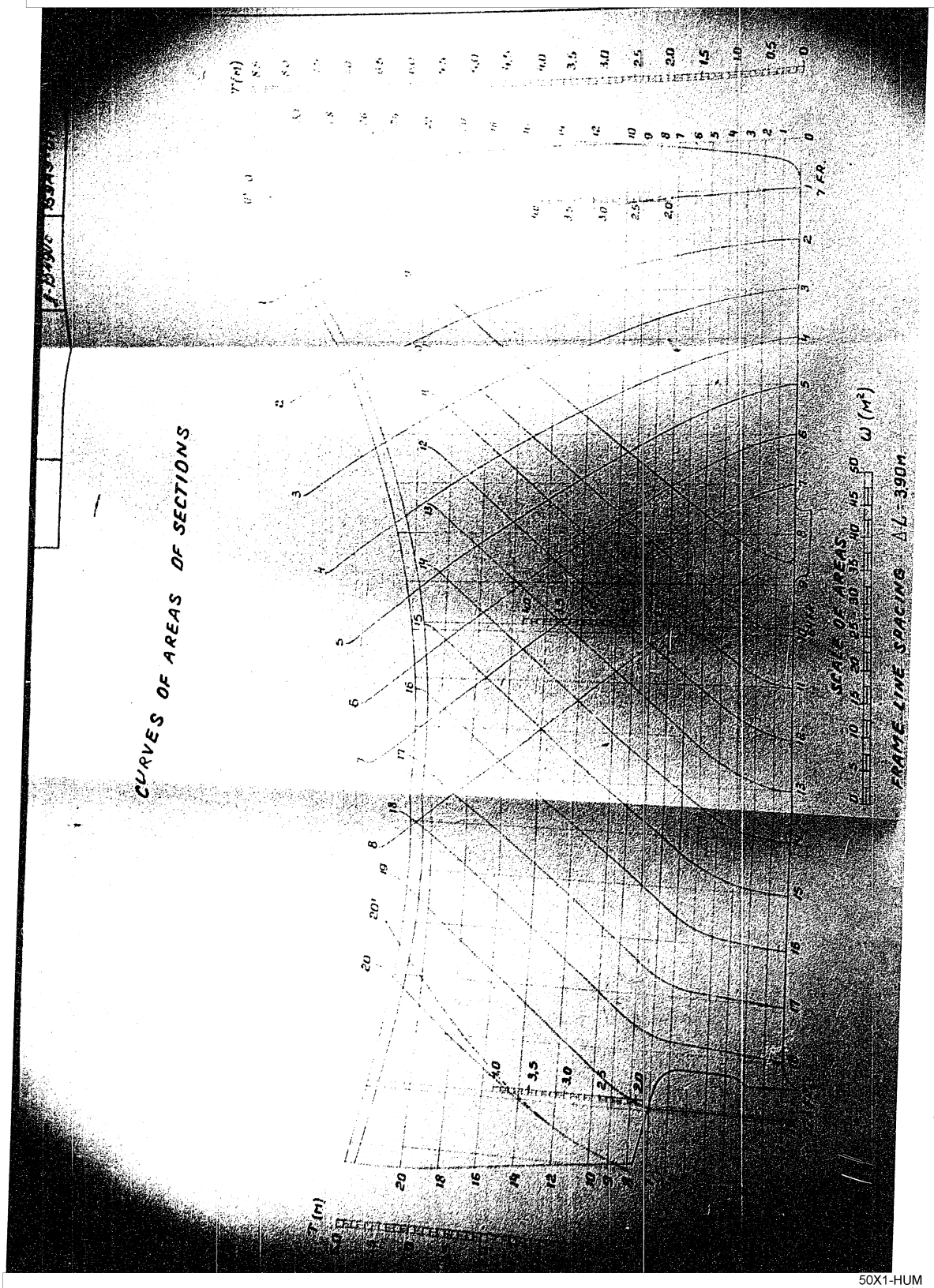

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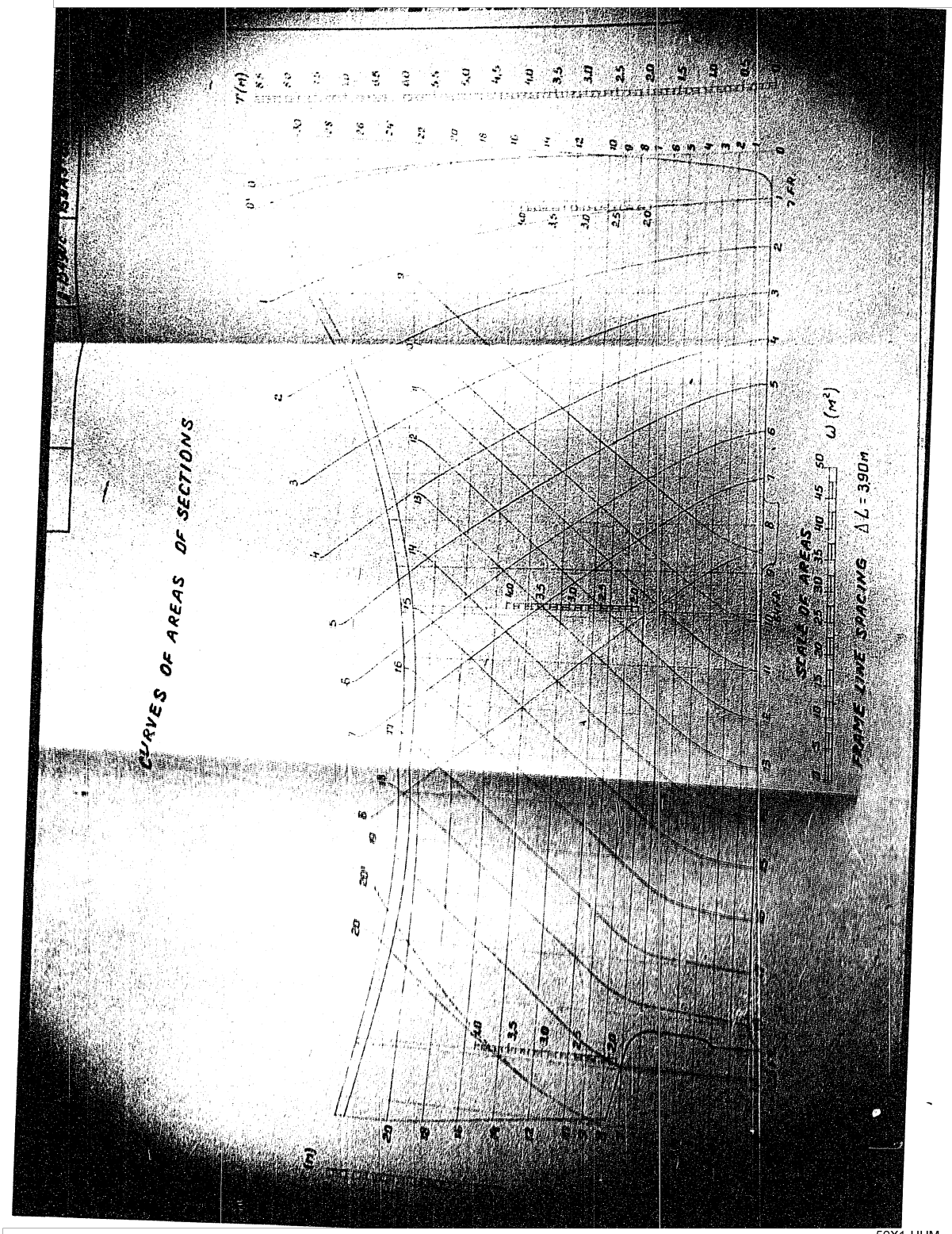

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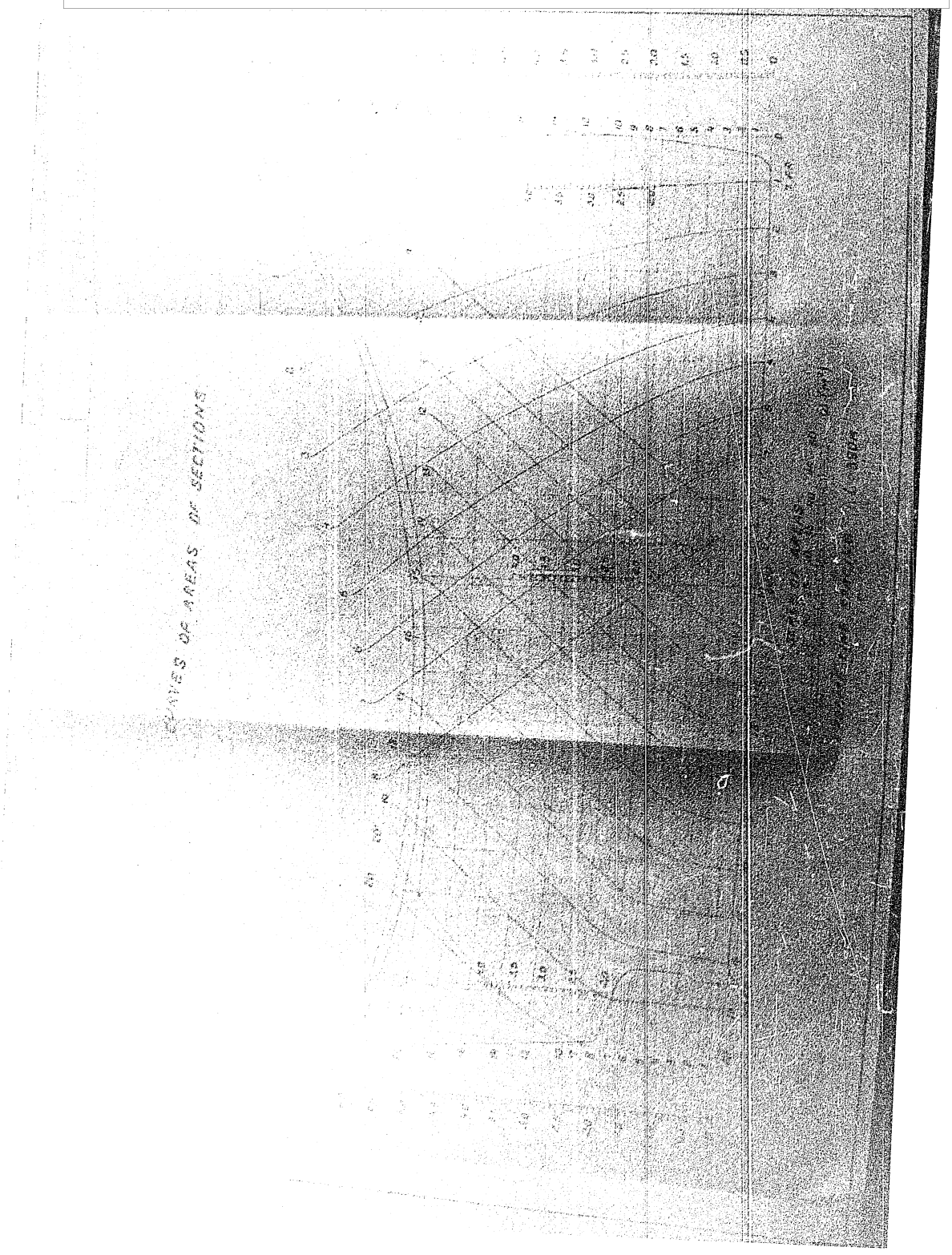

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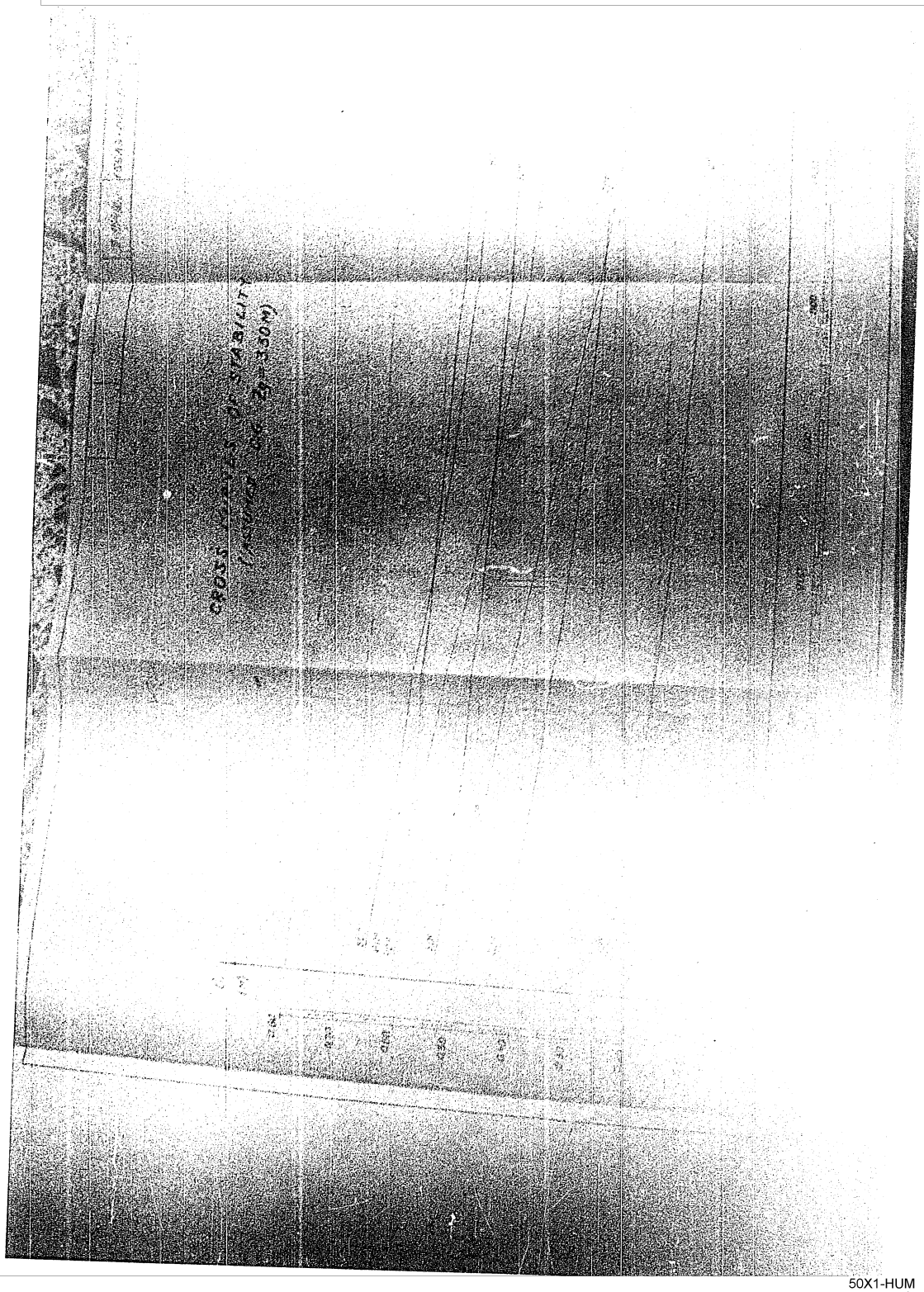

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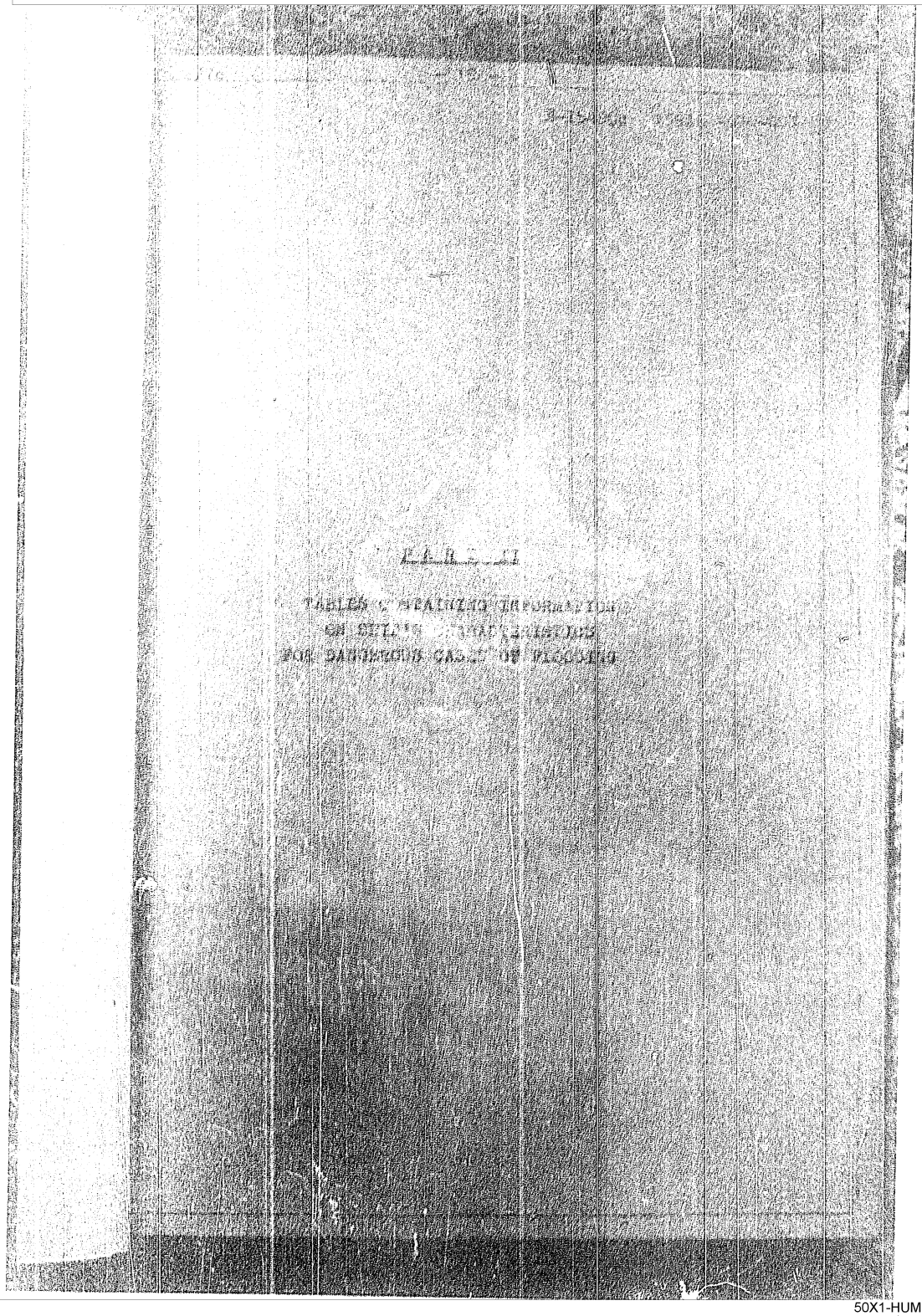

PART II

TABLES CONTAINING INFORMATION ON SPIN CHARACTERISTICS FOR DANGEROUS CASES OF FLOODING

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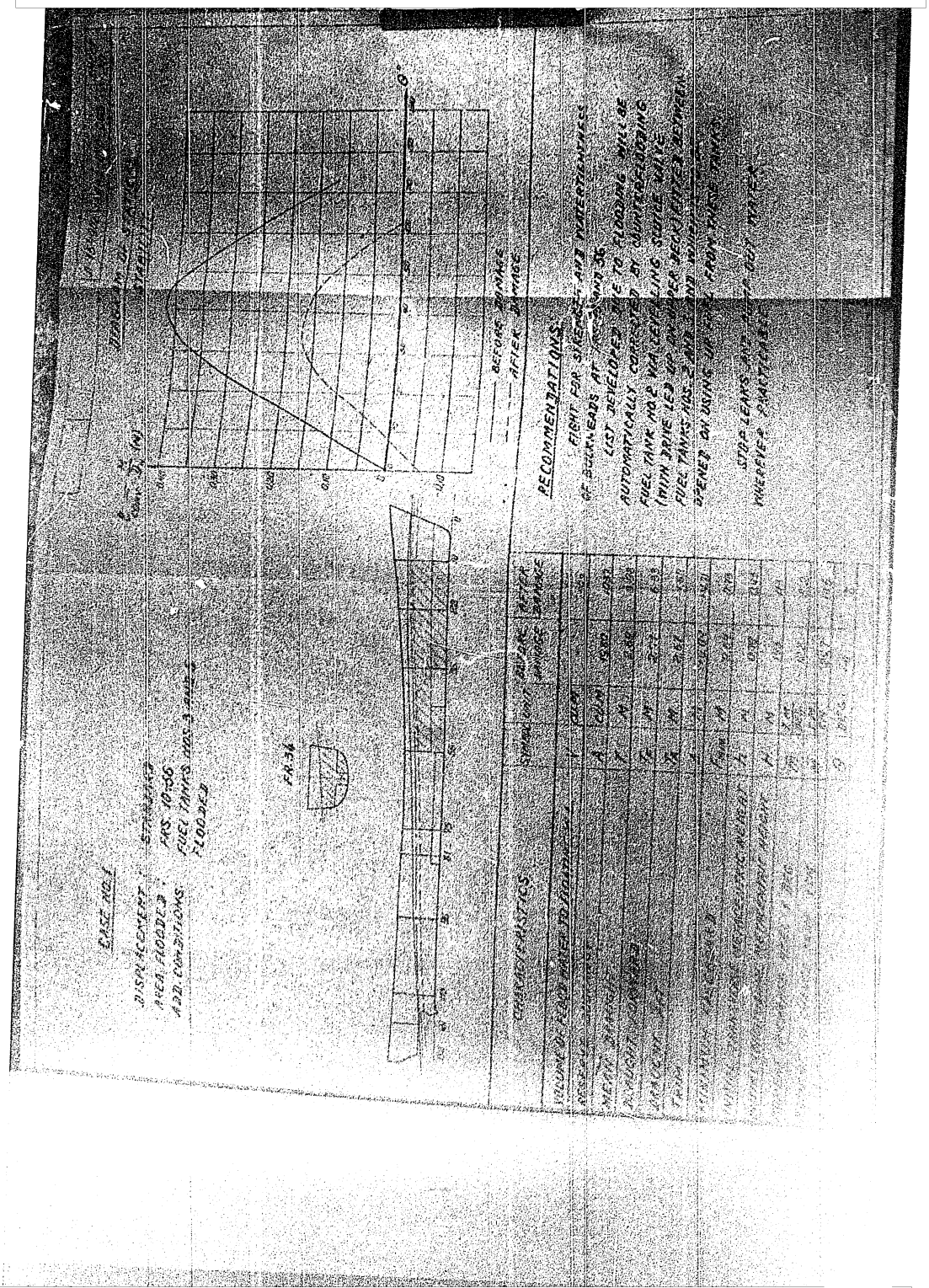

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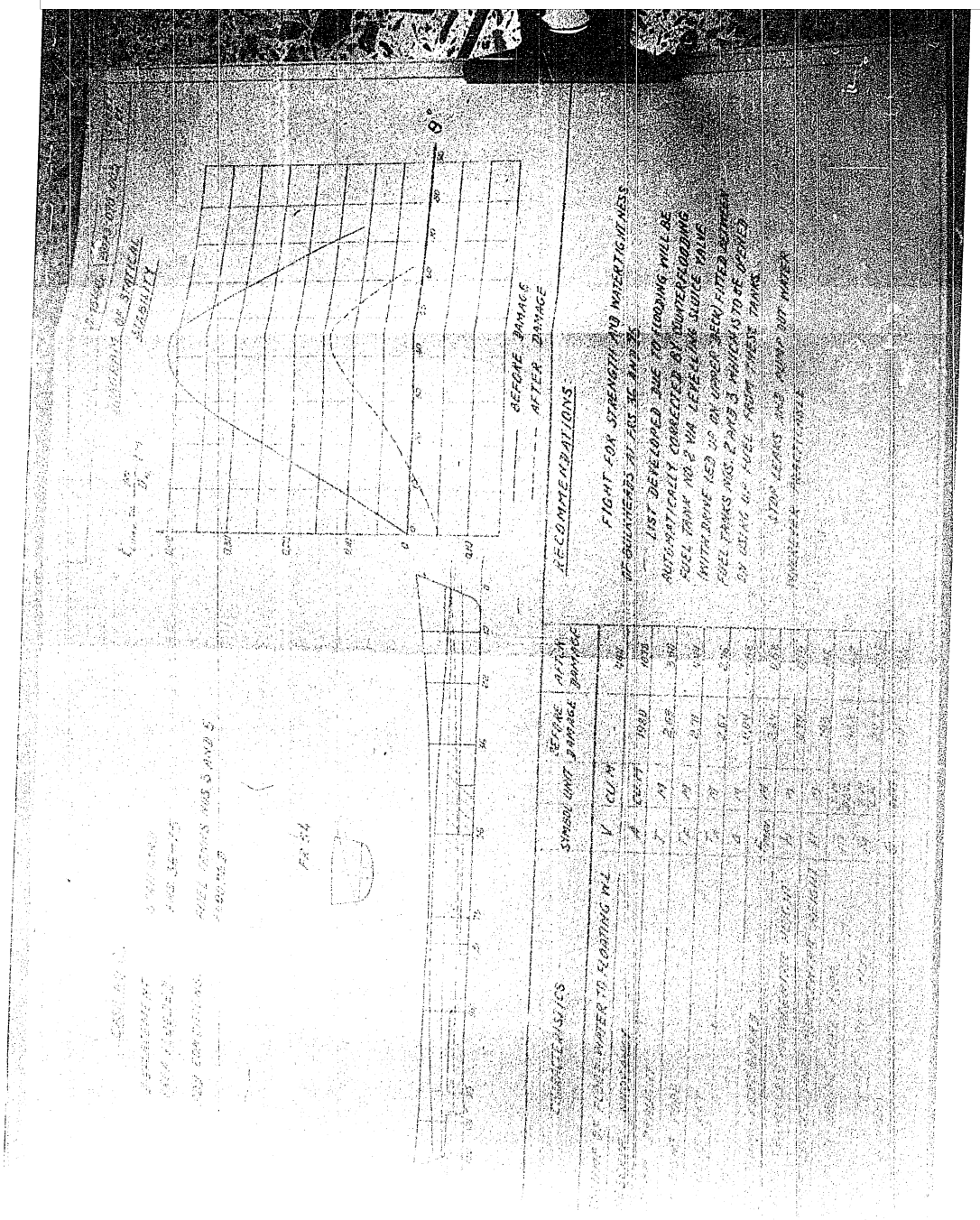

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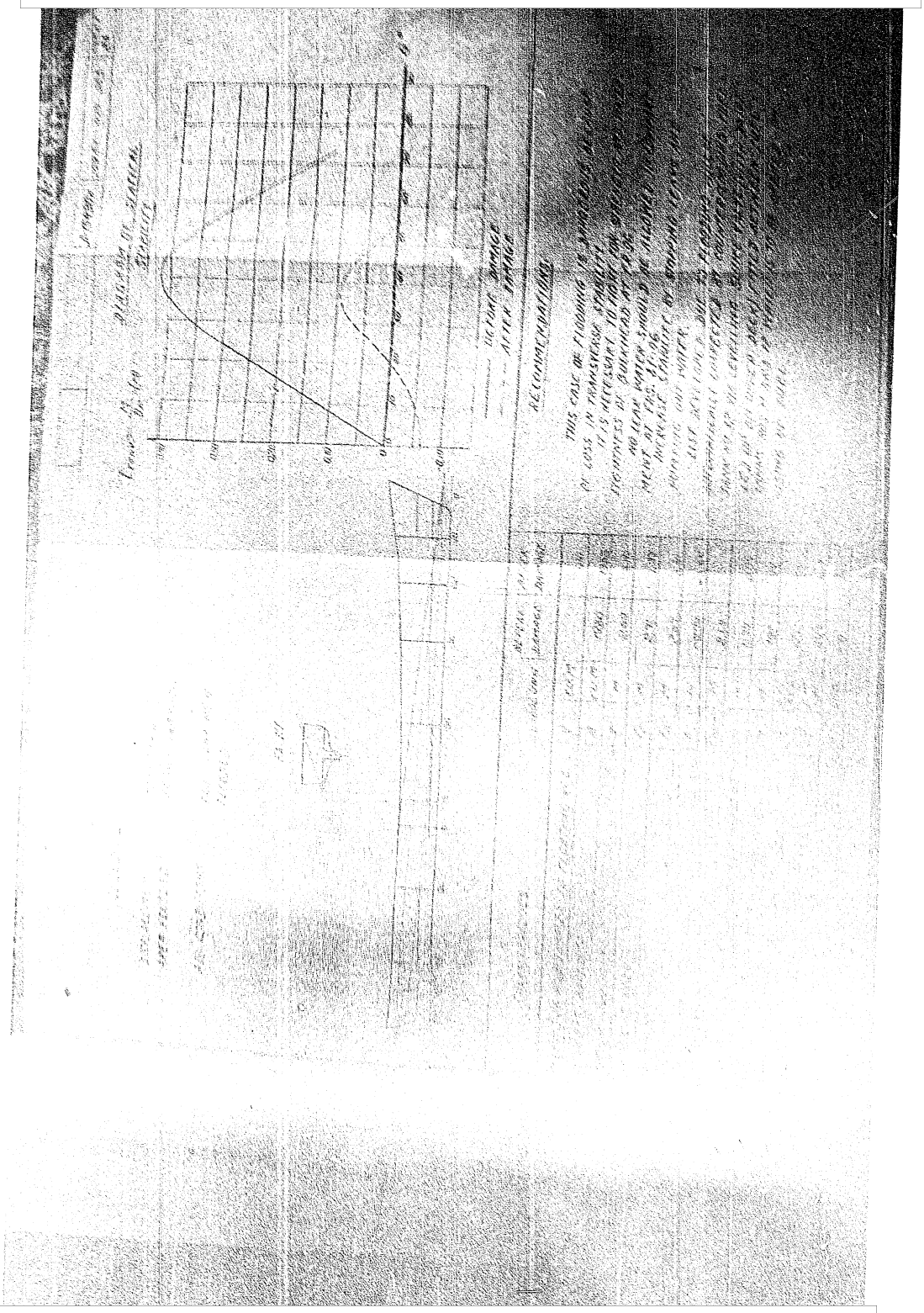

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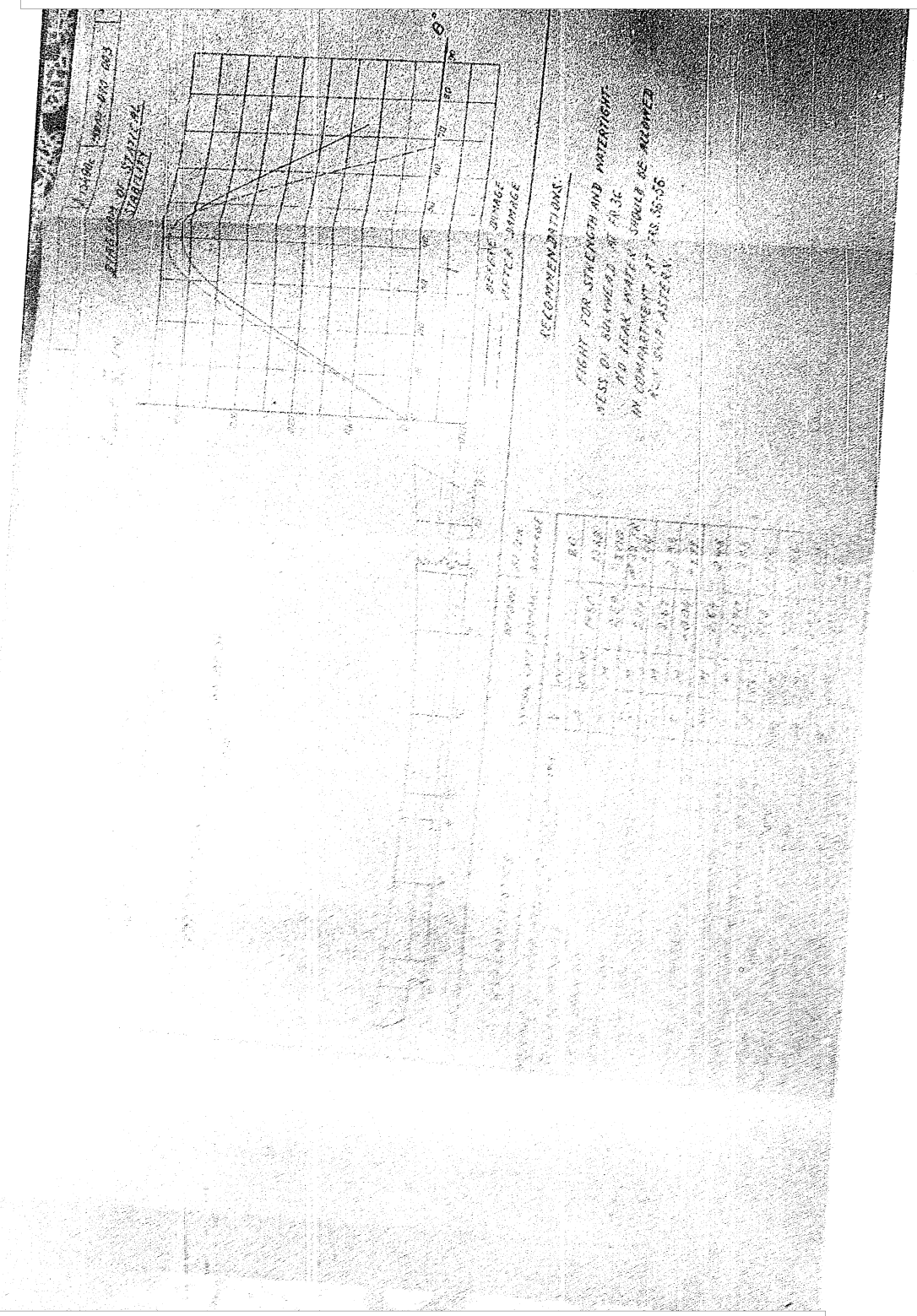

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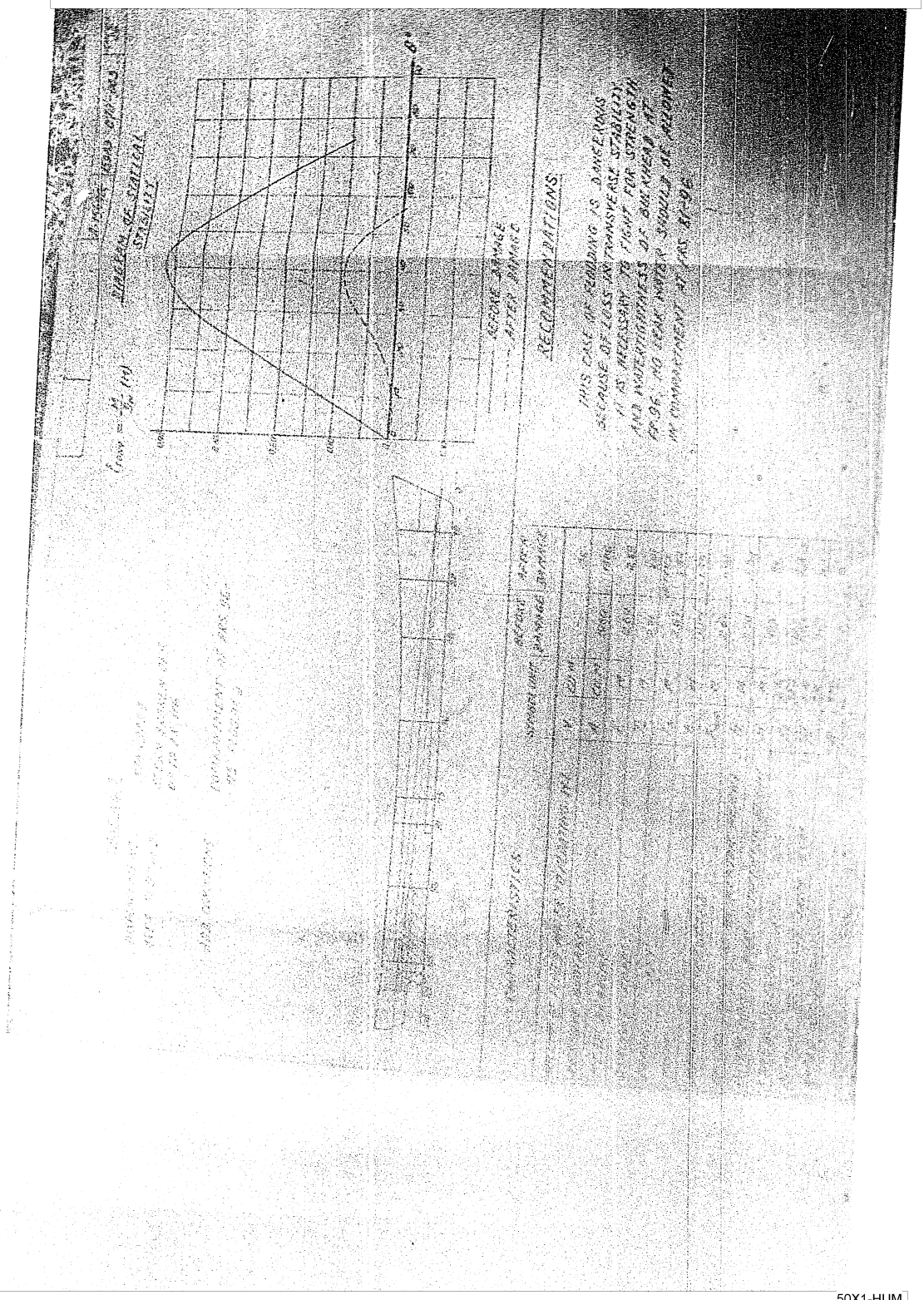

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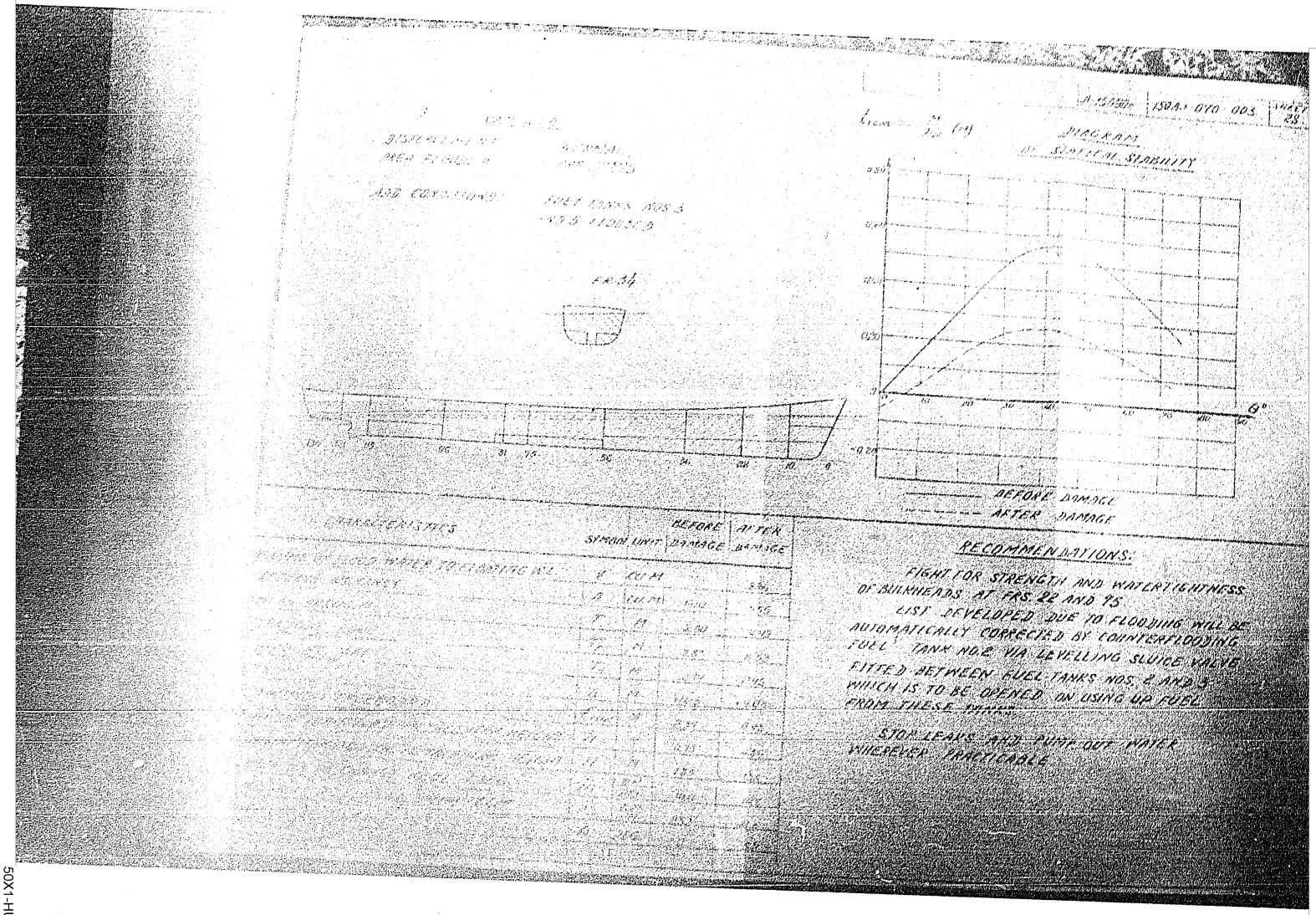

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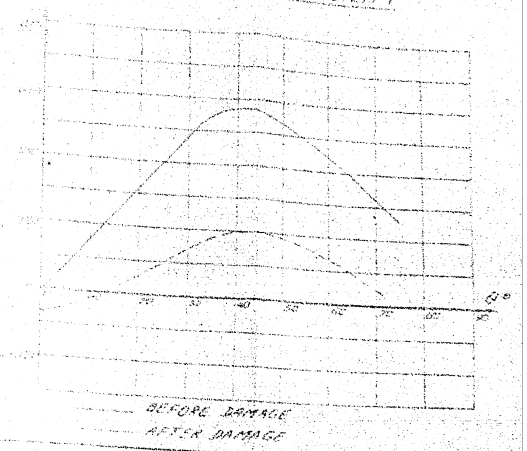
DIAGRAM
H STATICAL STABILITY



RECOMMENDATIONS:

FIGHT FOR STRENGTH AND WATERTIGHTNESS OF BULKHEADS AT FRS 81 AND 121.

LIST DEVELOPED DUE TO FLOODING WILL BE AUTOMATICALLY CORRECTED BY COUNTERFLOODING FUEL TANK NO.12 VIA LEVELLING SLUICE VALVE (WITH DRIVE LED UP ON UPPER DECK) FITTED BETWEEN FUEL TANKS NOS 11 AND 12 WHICH IS TO BE OPENED ON USING UP FUEL FROM THESE TANKS.

STOP LEAKS AND PUMP OUT WATER WHEREVER PRACTICABLE.

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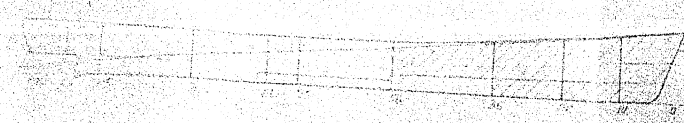
J-15490c | 159A9-070-003

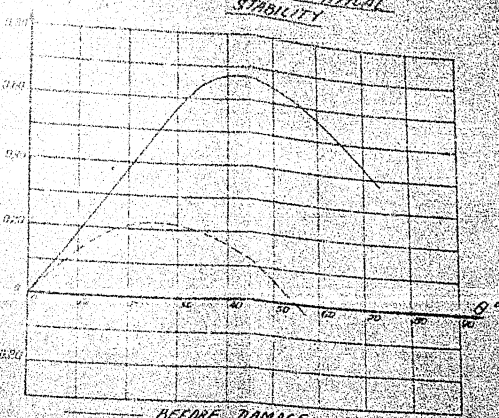
DISPLACEMENT: [illegible]
AREA FLOODED: FRS 9-56

ADD CONDITIONS: NONE



$l_{cont} = \frac{M}{D_M}$ (m)

DIAGRAM OF STATICAL STABILITY



[illegible]	SYMBOL	UNIT	BEFORE DAMAGE	AFTER DAMAGE
[illegible] TO FLOATING W.L.	V	CUM		[illegible]
[illegible]	A	CUM	[illegible]	[illegible]
[illegible]	T	M	[illegible]	[illegible]
[illegible]	T_F	M	[illegible]	[illegible]
[illegible]	T_A	M	[illegible]	[illegible]
[illegible]	Δ	M	[illegible]	[illegible]
[illegible]	T_{max}	M	[illegible]	
[illegible] HEIGHT	h_1	M	[illegible]	[illegible]
[illegible] HEIGHT	θ	M	[illegible]	[illegible]
[illegible]	$\bar{m}$	T.M. DEG	[illegible]	[illegible]
[illegible]	$\bar{M}$	T.M. CM	[illegible]	[illegible]
[illegible]	θ	DEG	[illegible]	[illegible]

RECOMMENDATIONS:

THIS CASE OF FLOODING IS DANGEROUS BECAUSE OF LOSS IN LONGITUDINAL STABILITY.

IT IS NECESSARY TO FIGHT FOR STRENGTH AND WATERTIGHTNESS OF BULKHEAD AT FR 56 SINCE UPON FLOODING OF COMPARTMENT AT FRS 56-75 THE SHIP WILL FOUNDER.

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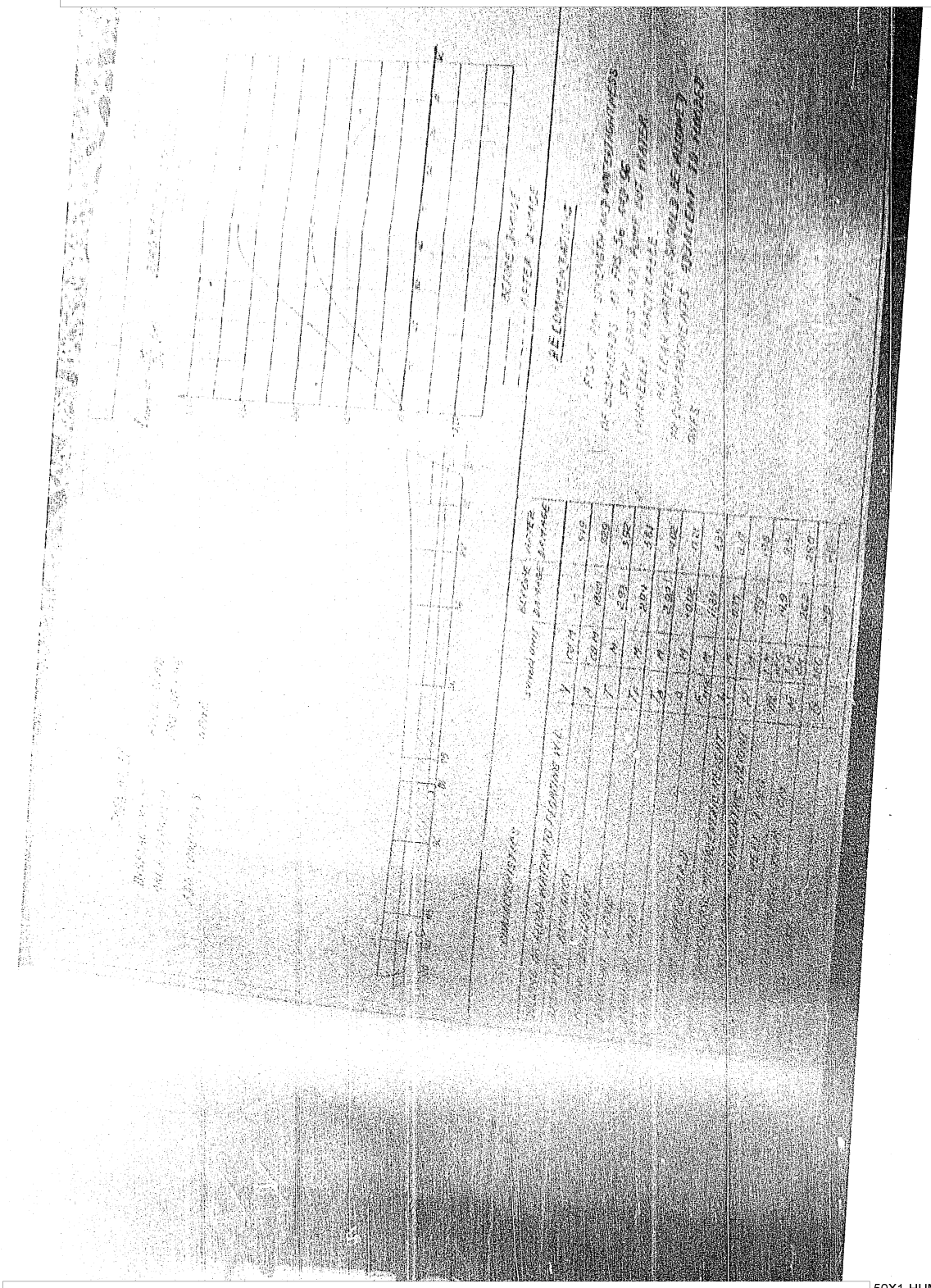

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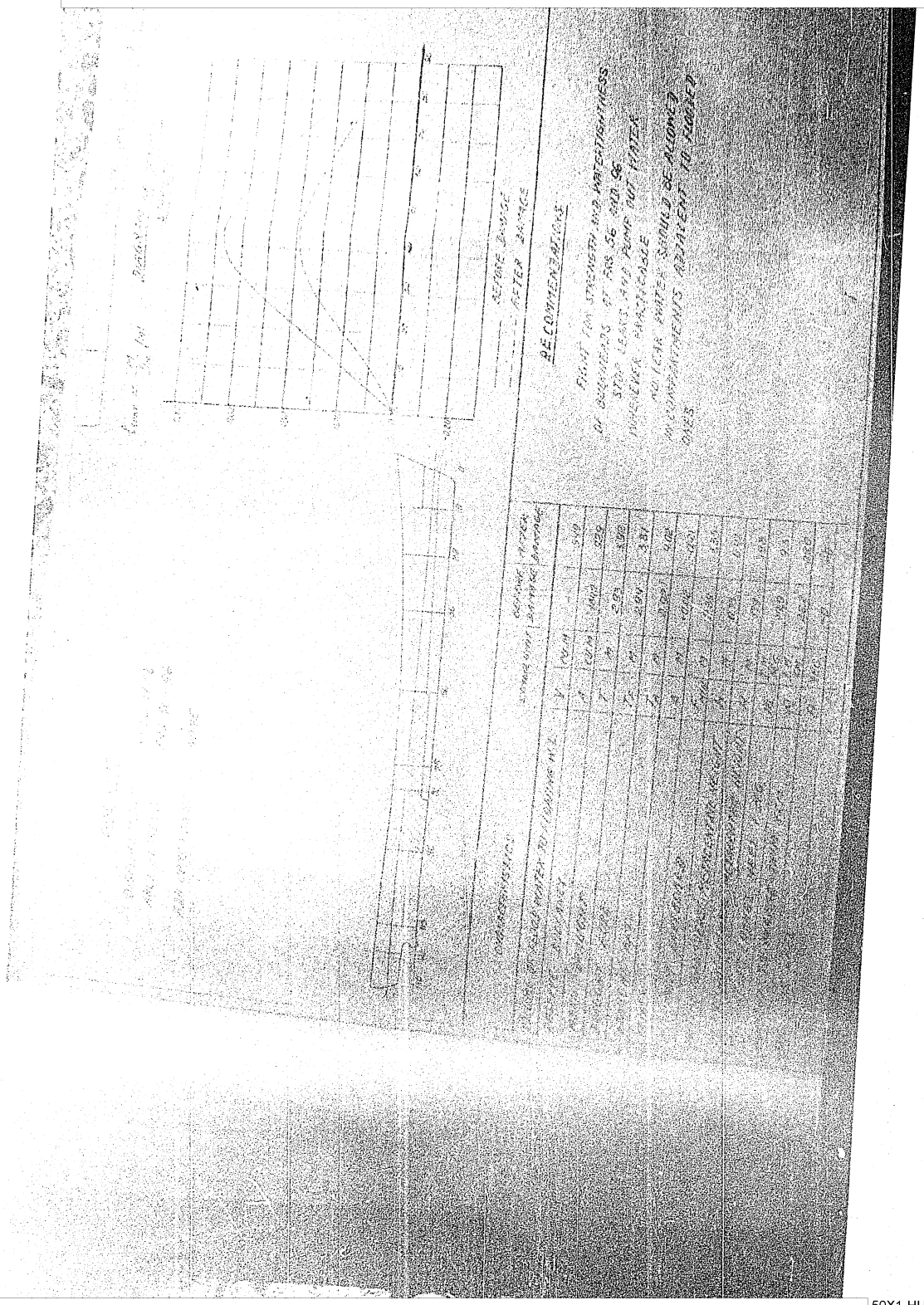

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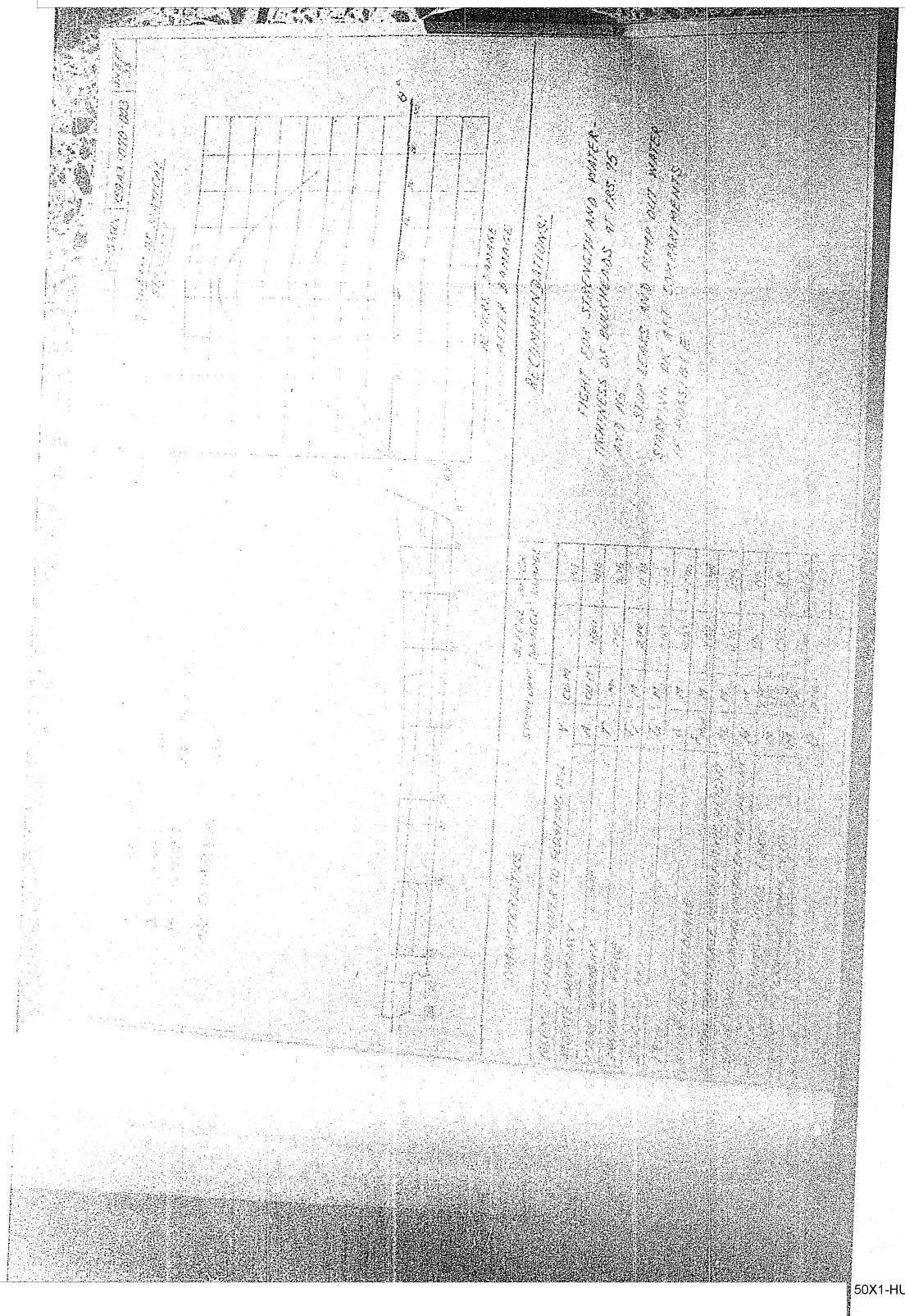

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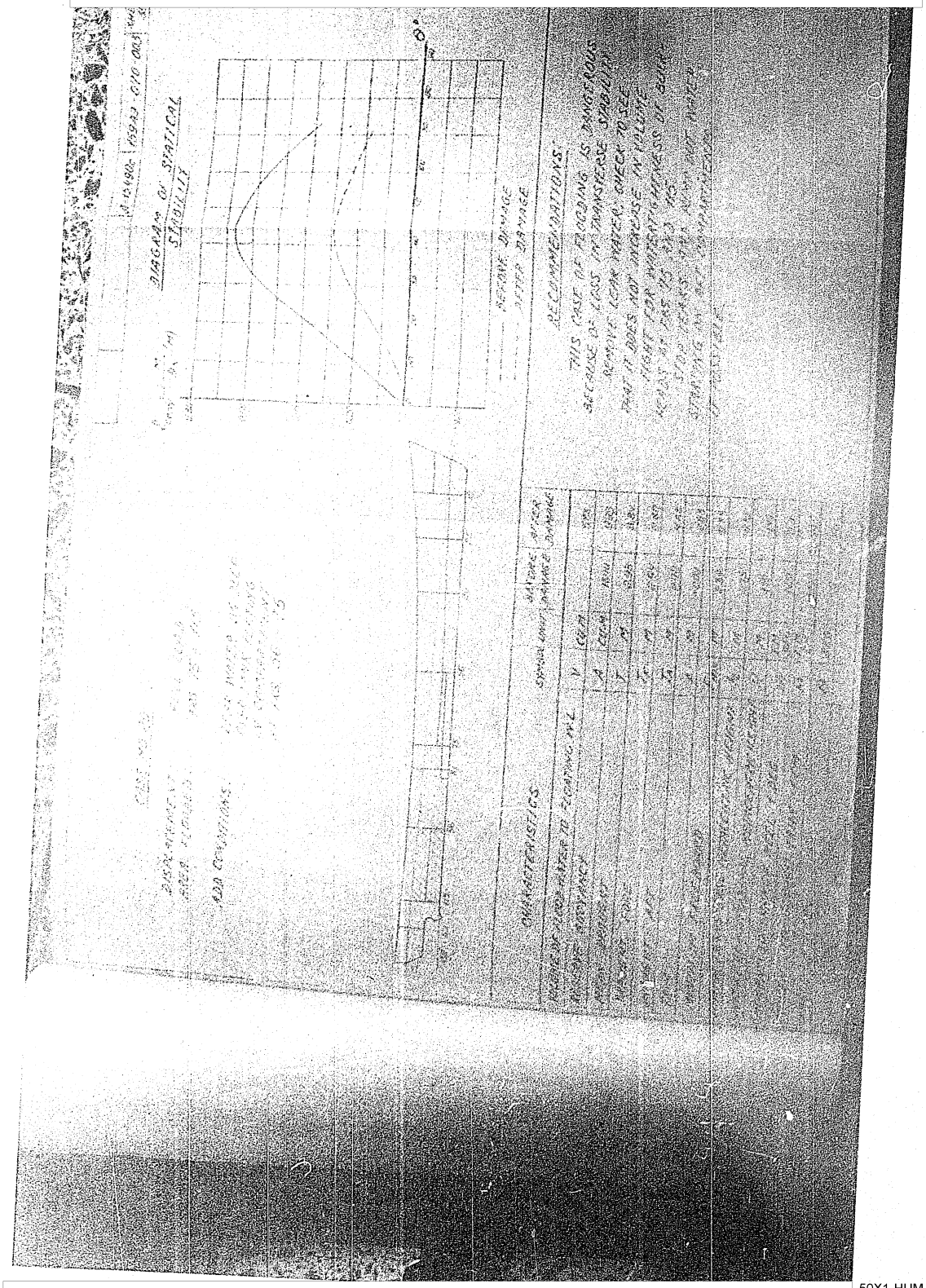

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PART III

TABLES
CONTAINING CHARACTERISTICS
OF PARTITIONED COMPARTMENTS

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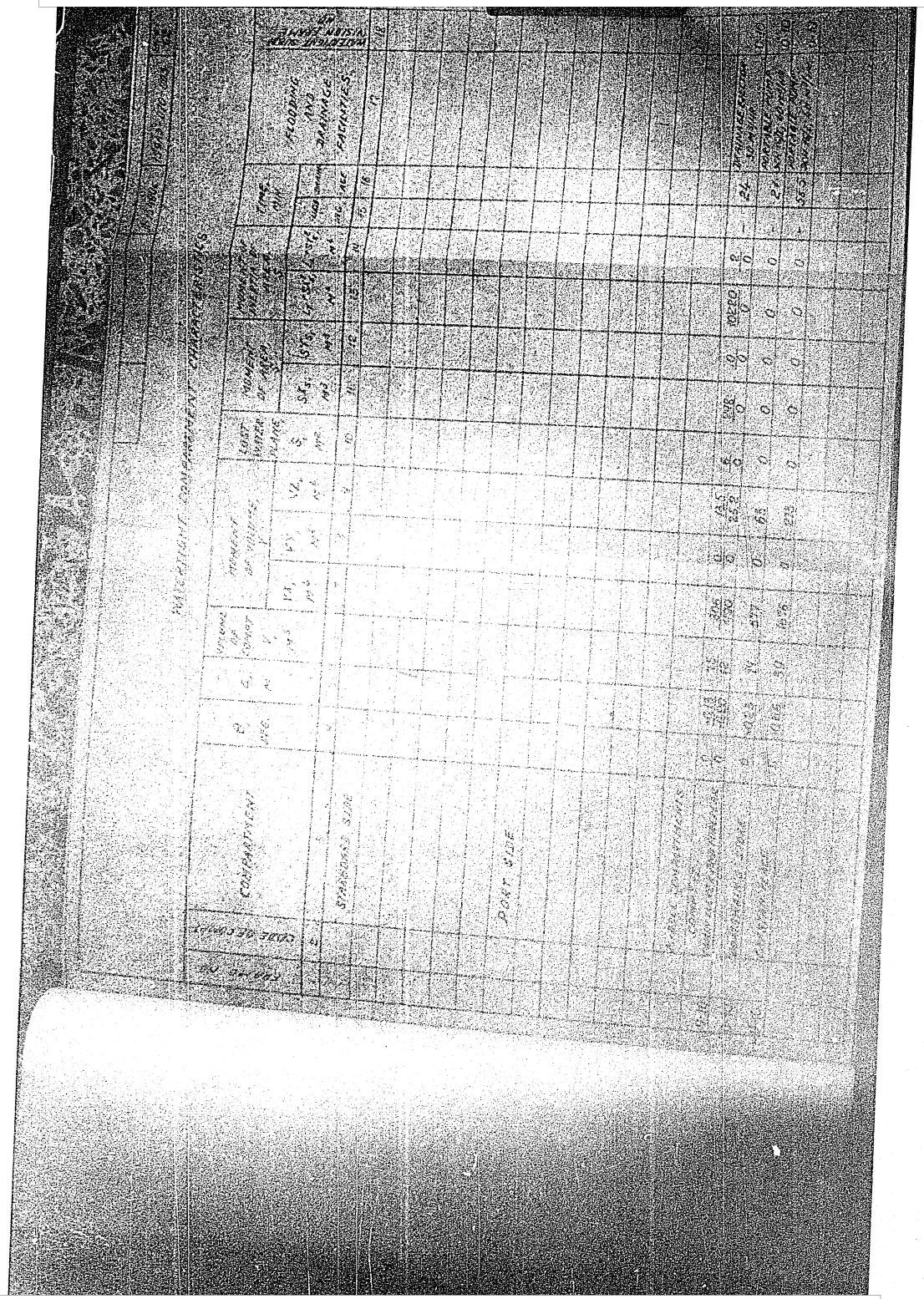

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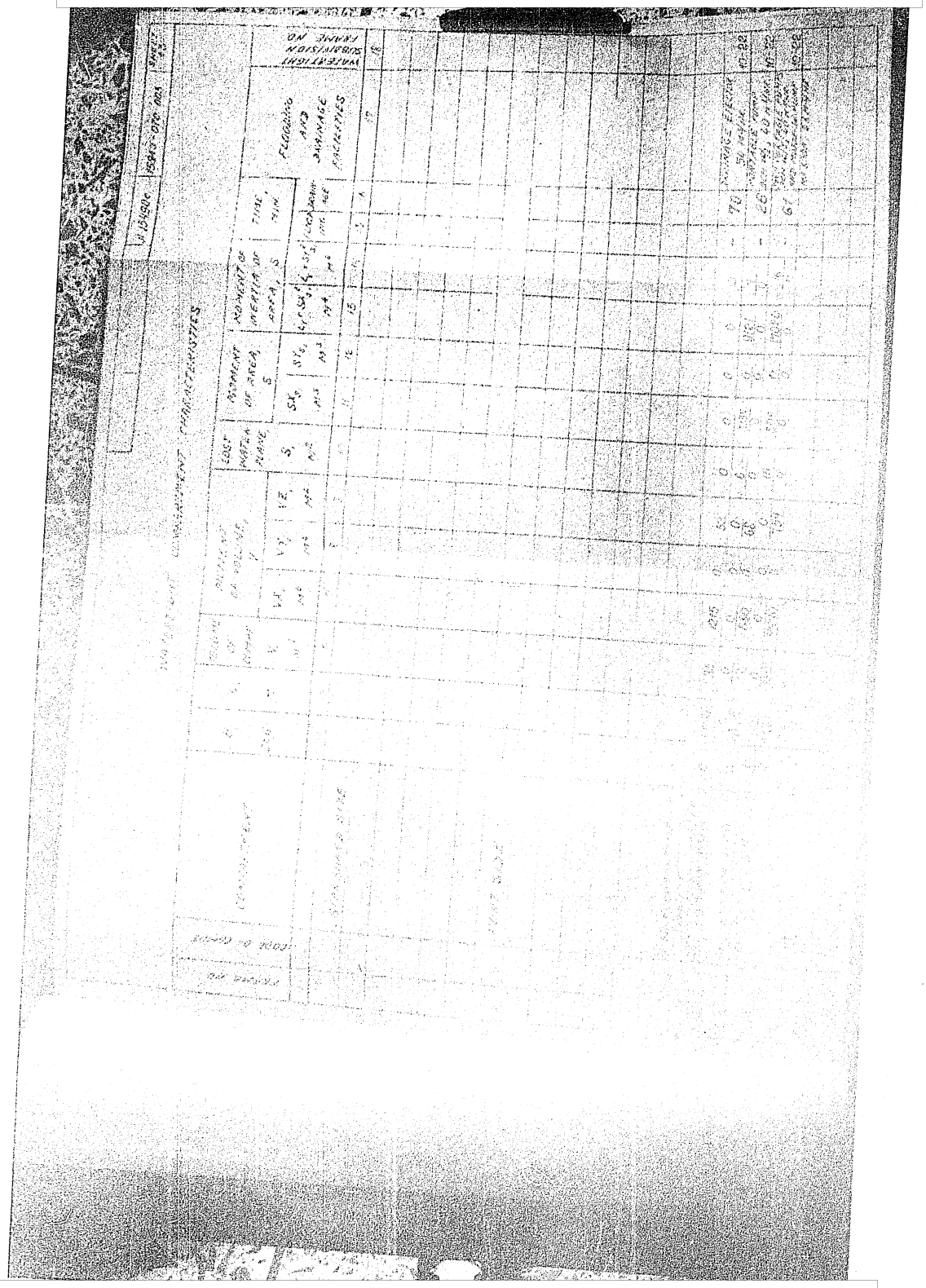

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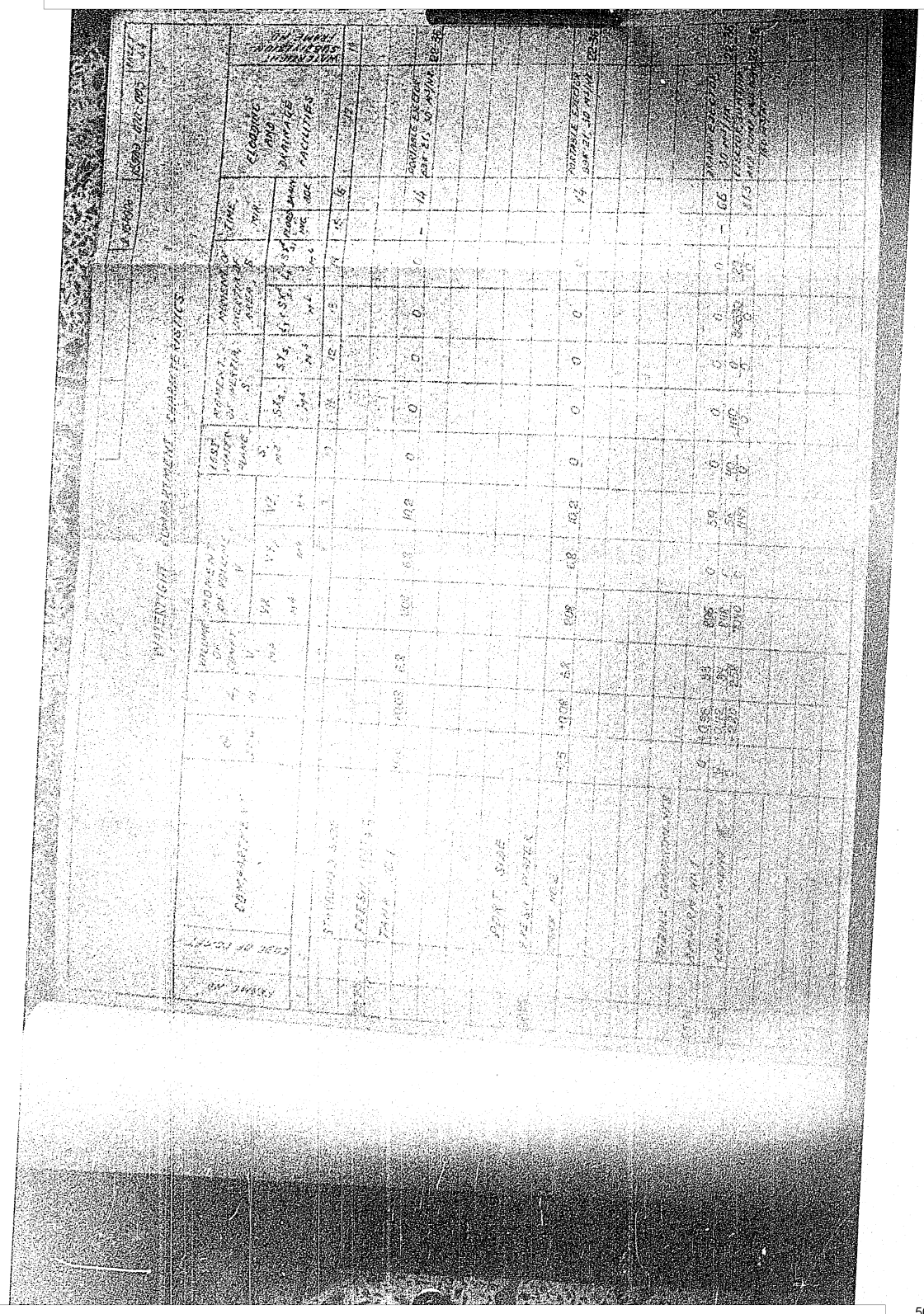

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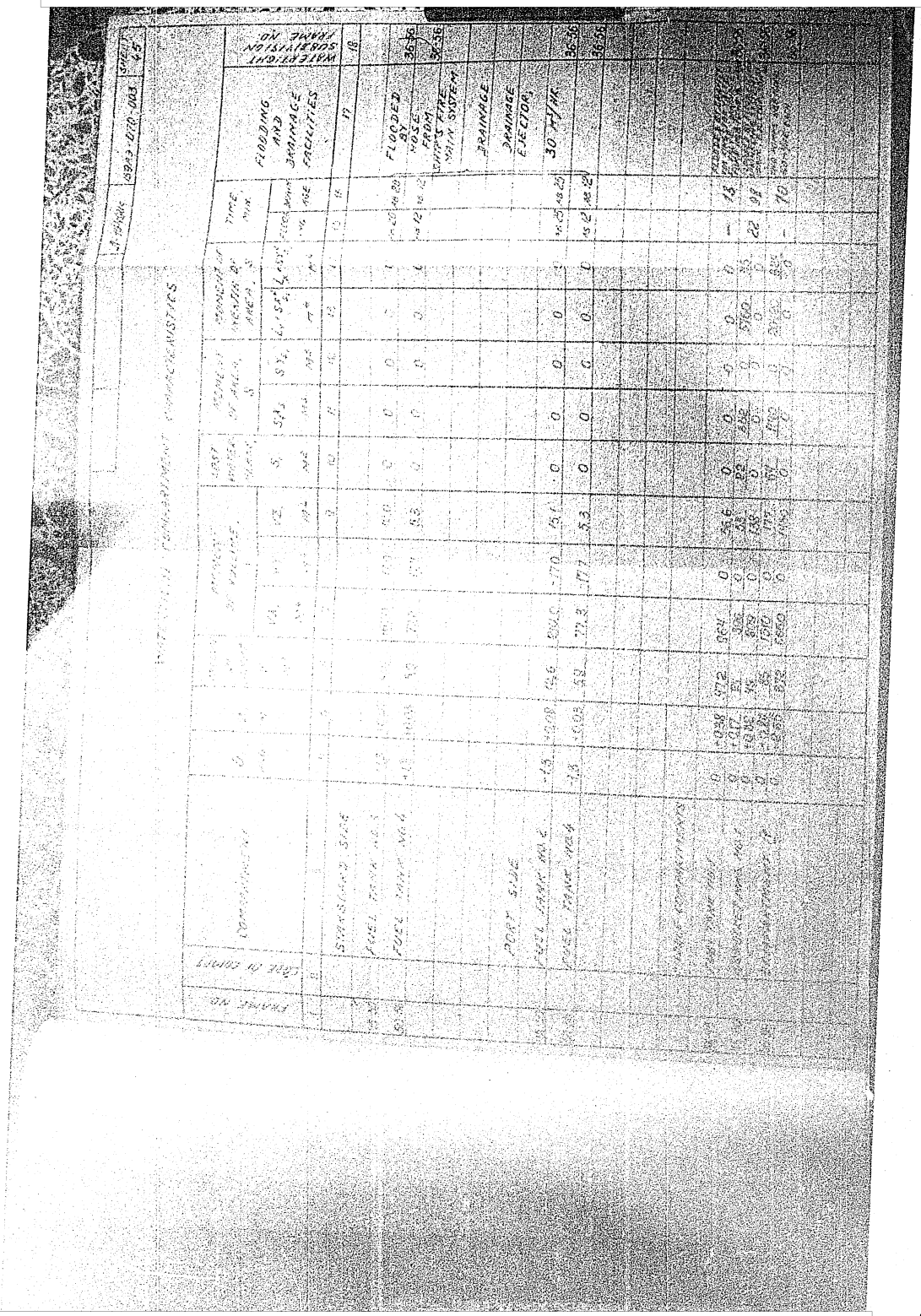

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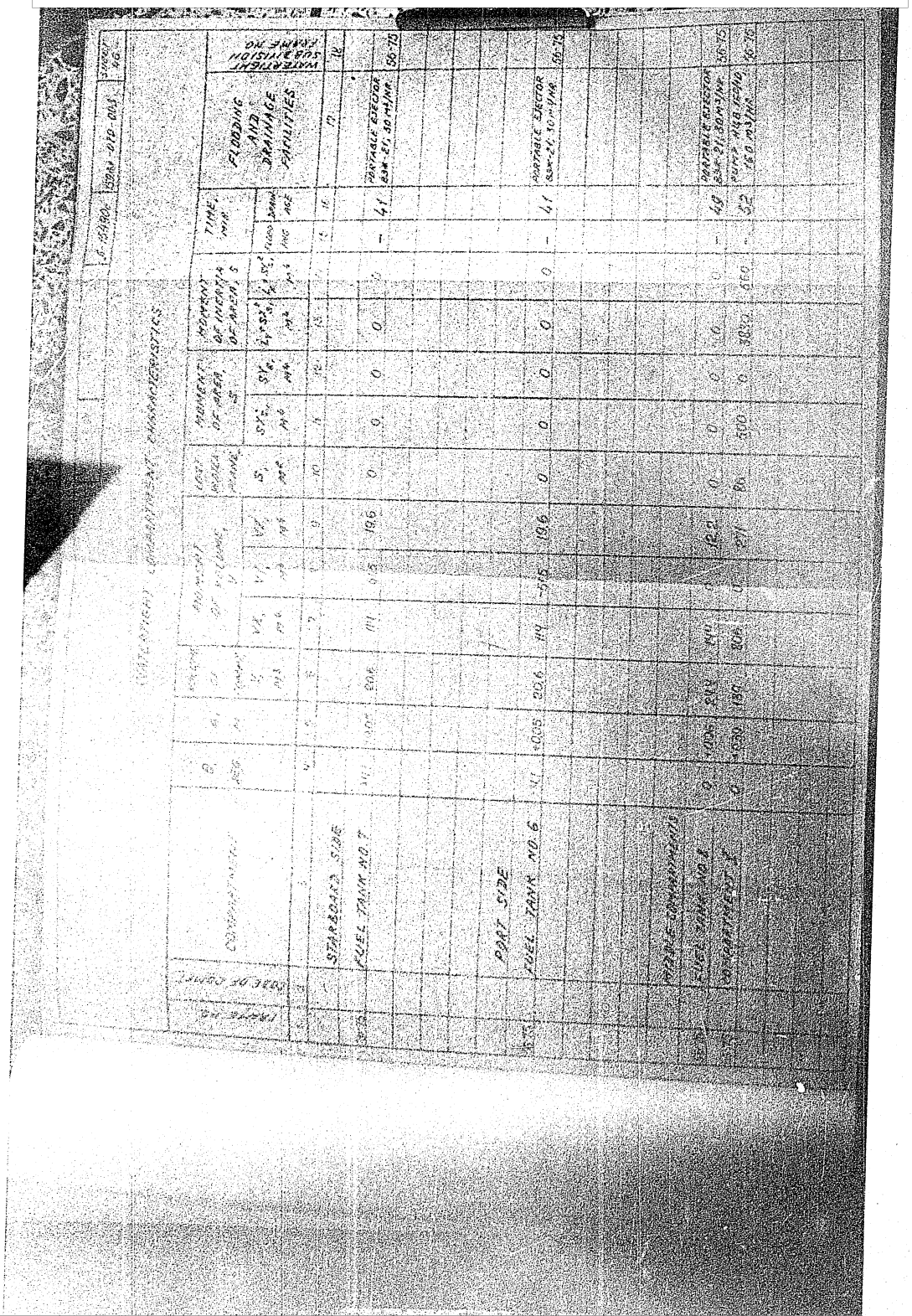

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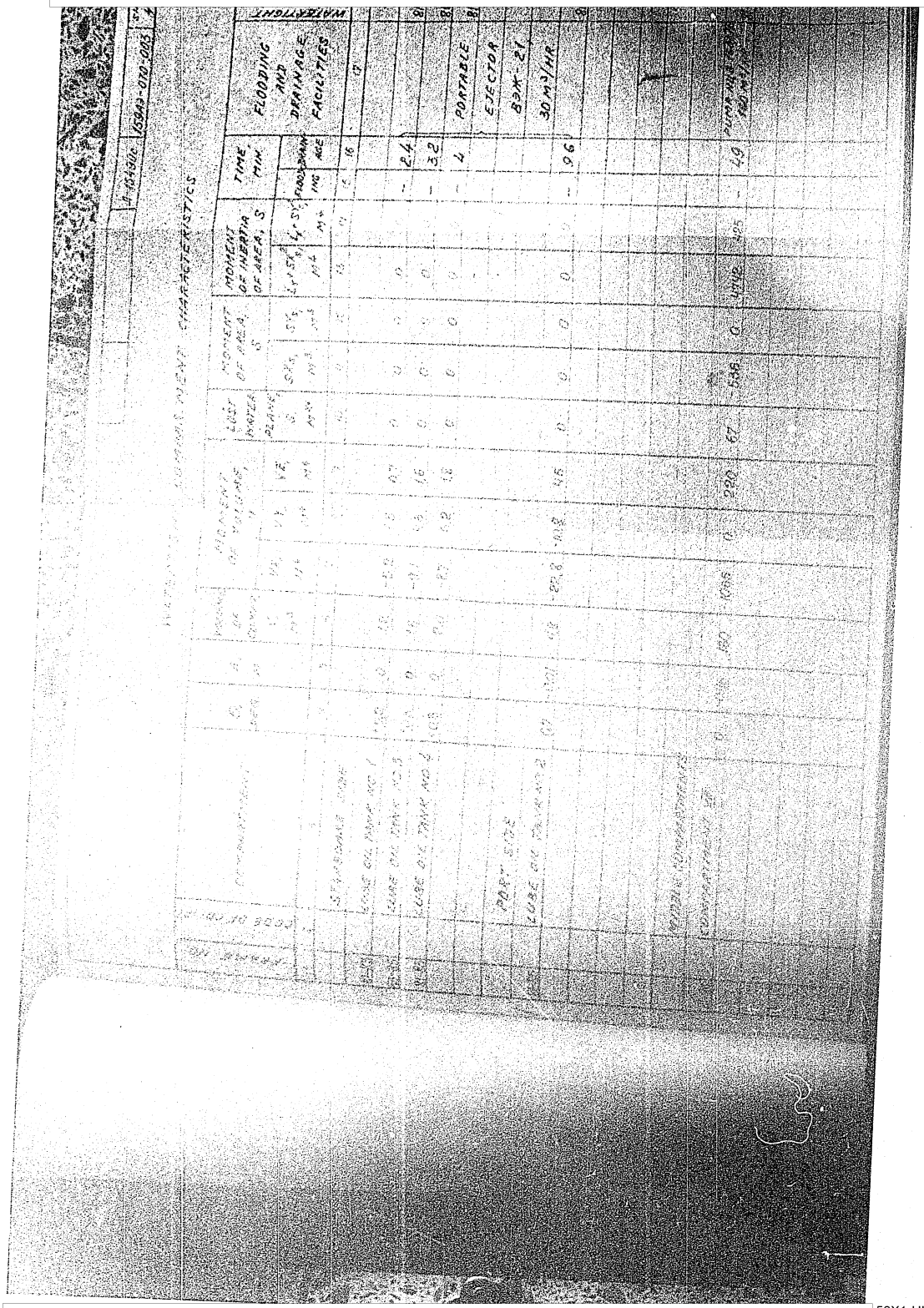

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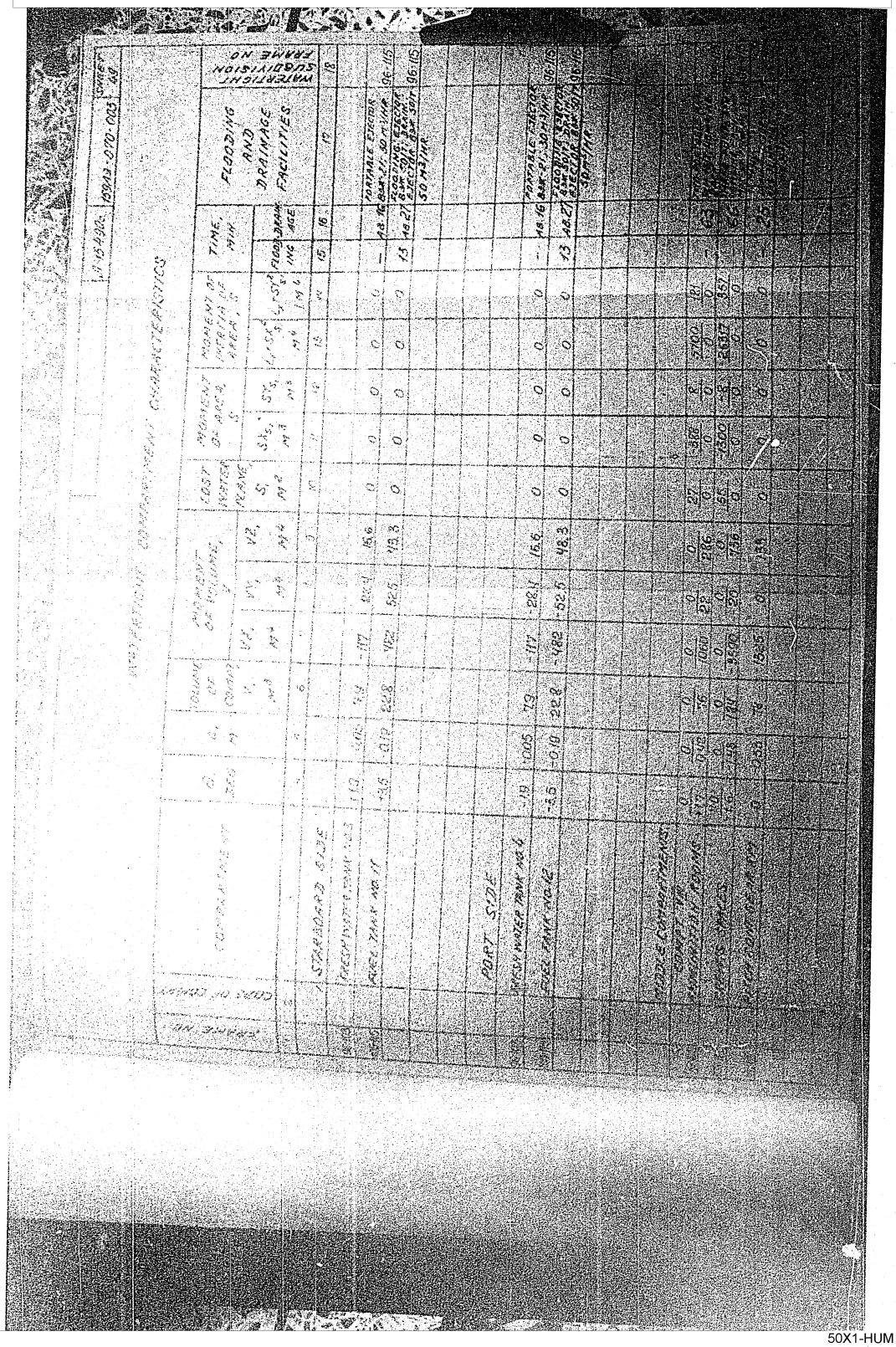

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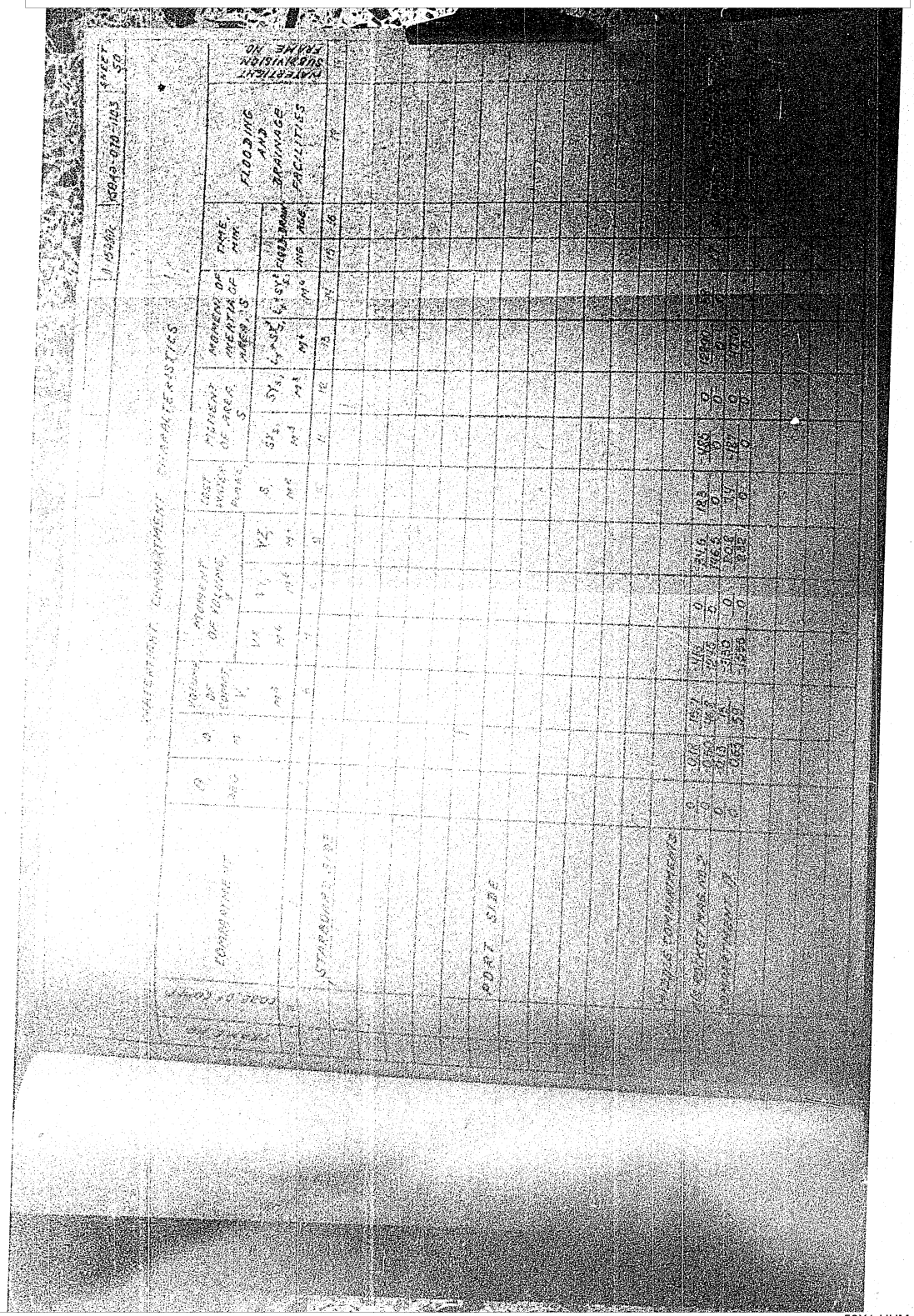

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STARBOARD SIDE

PORT SIDE

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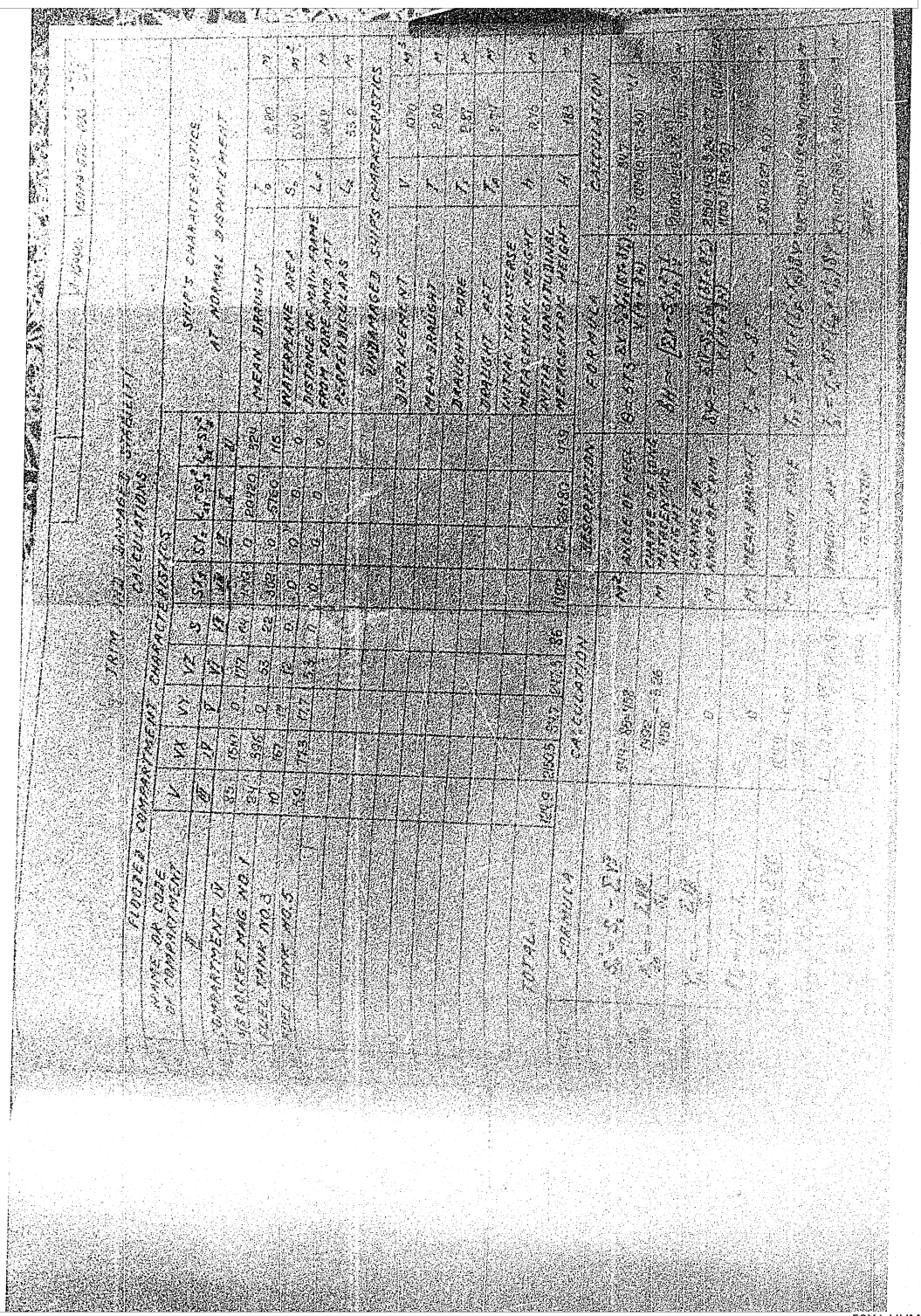

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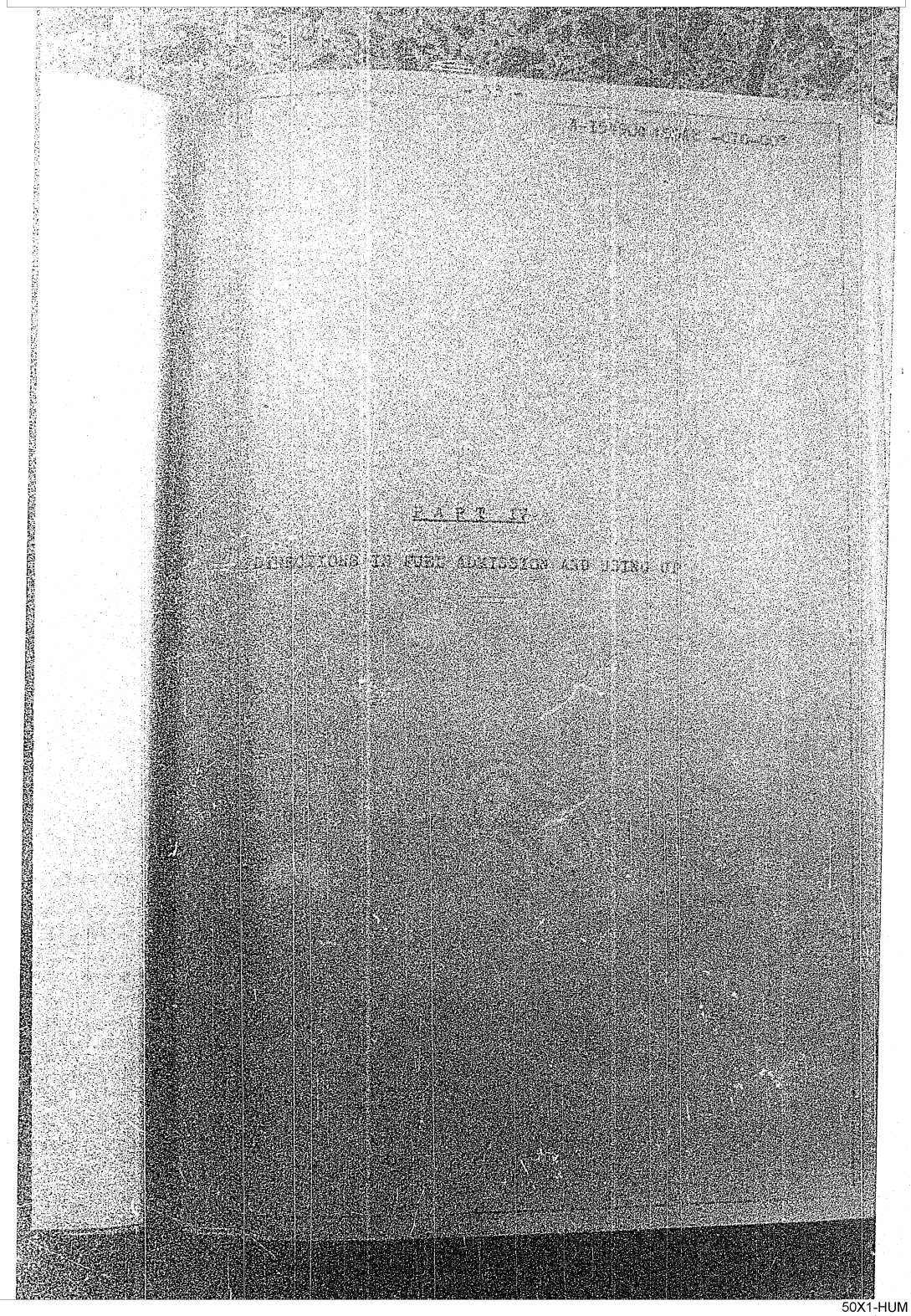

P A R T IV

DIRECTIONS IN FUEL ADMISSION AND USING IT

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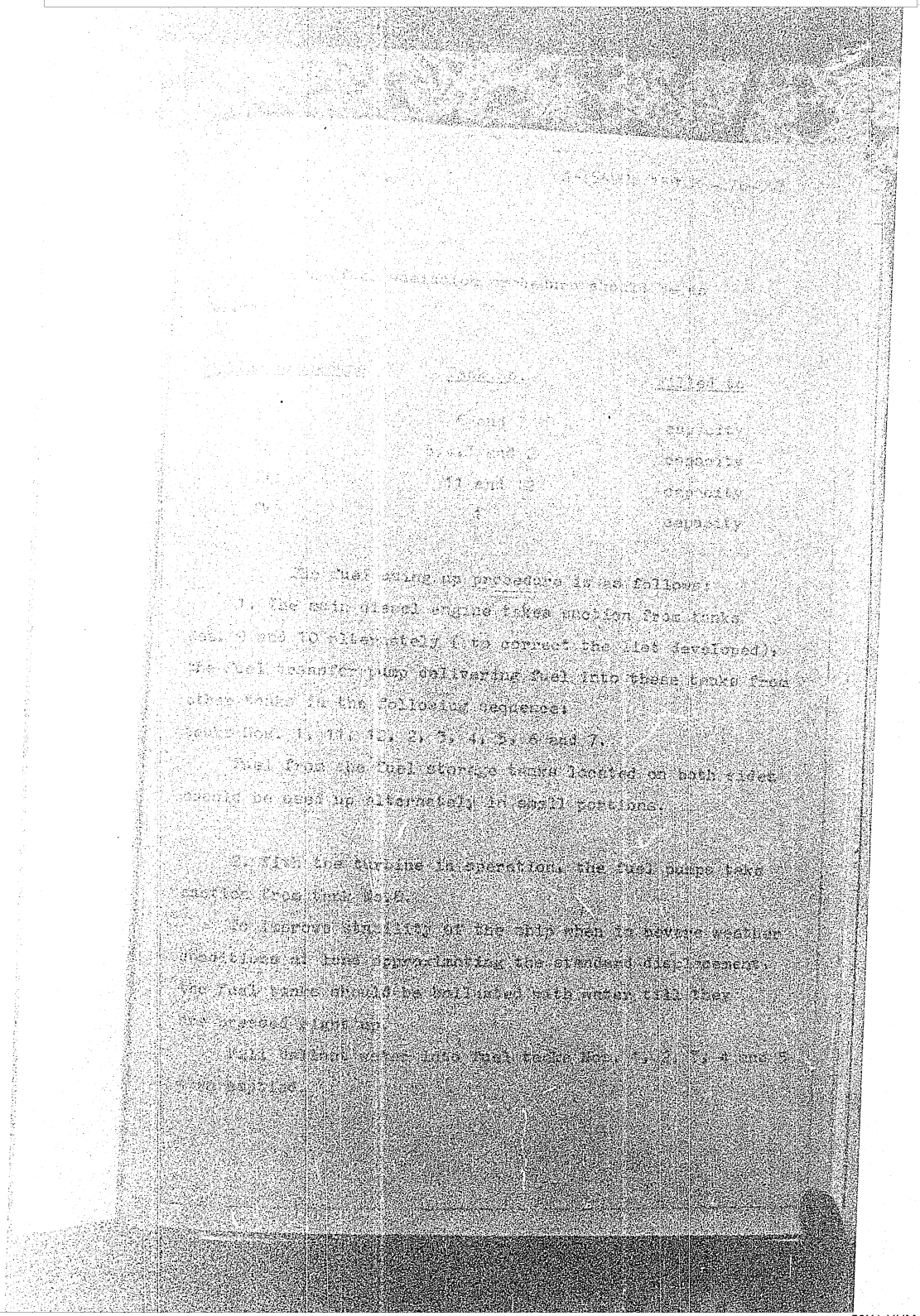

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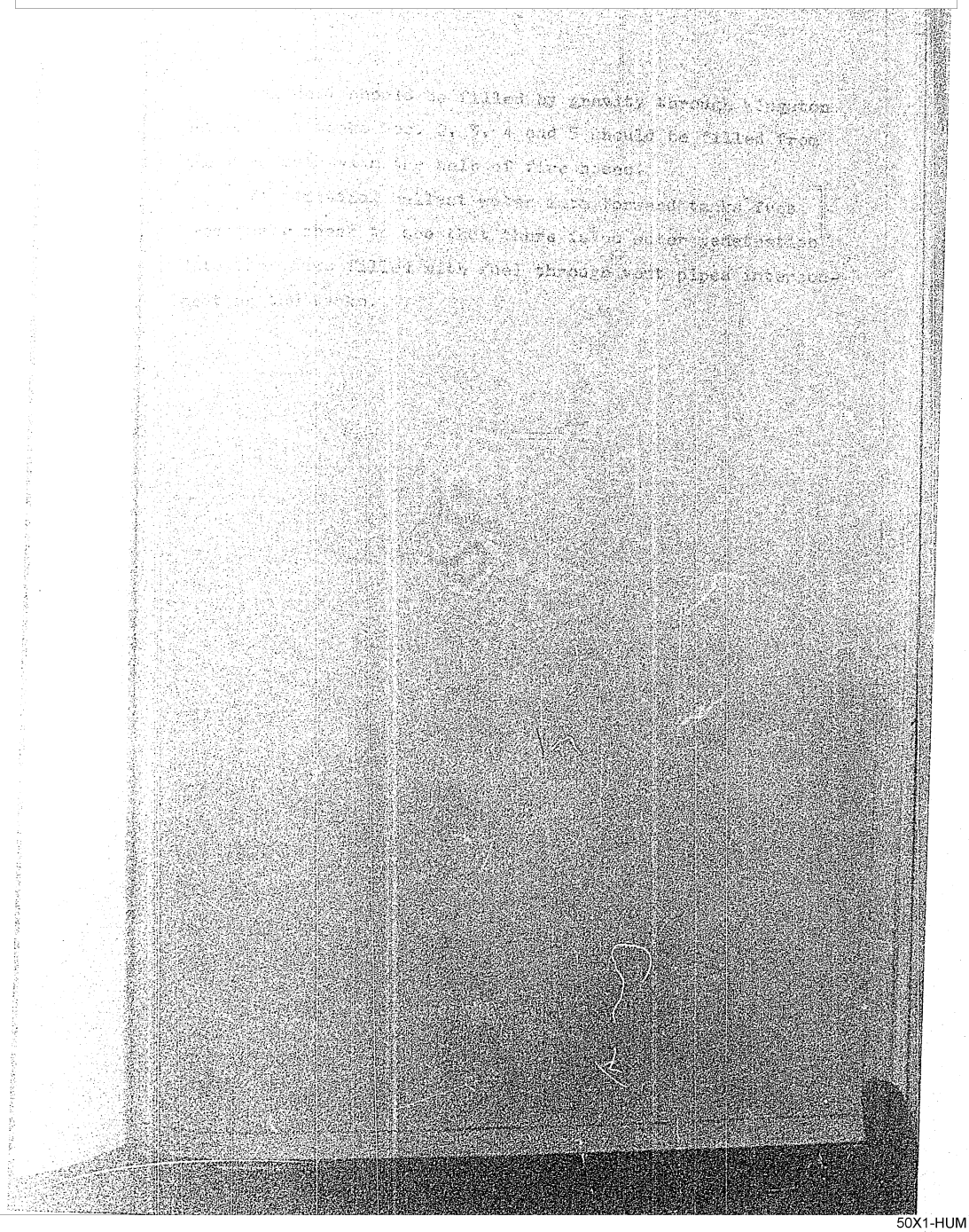

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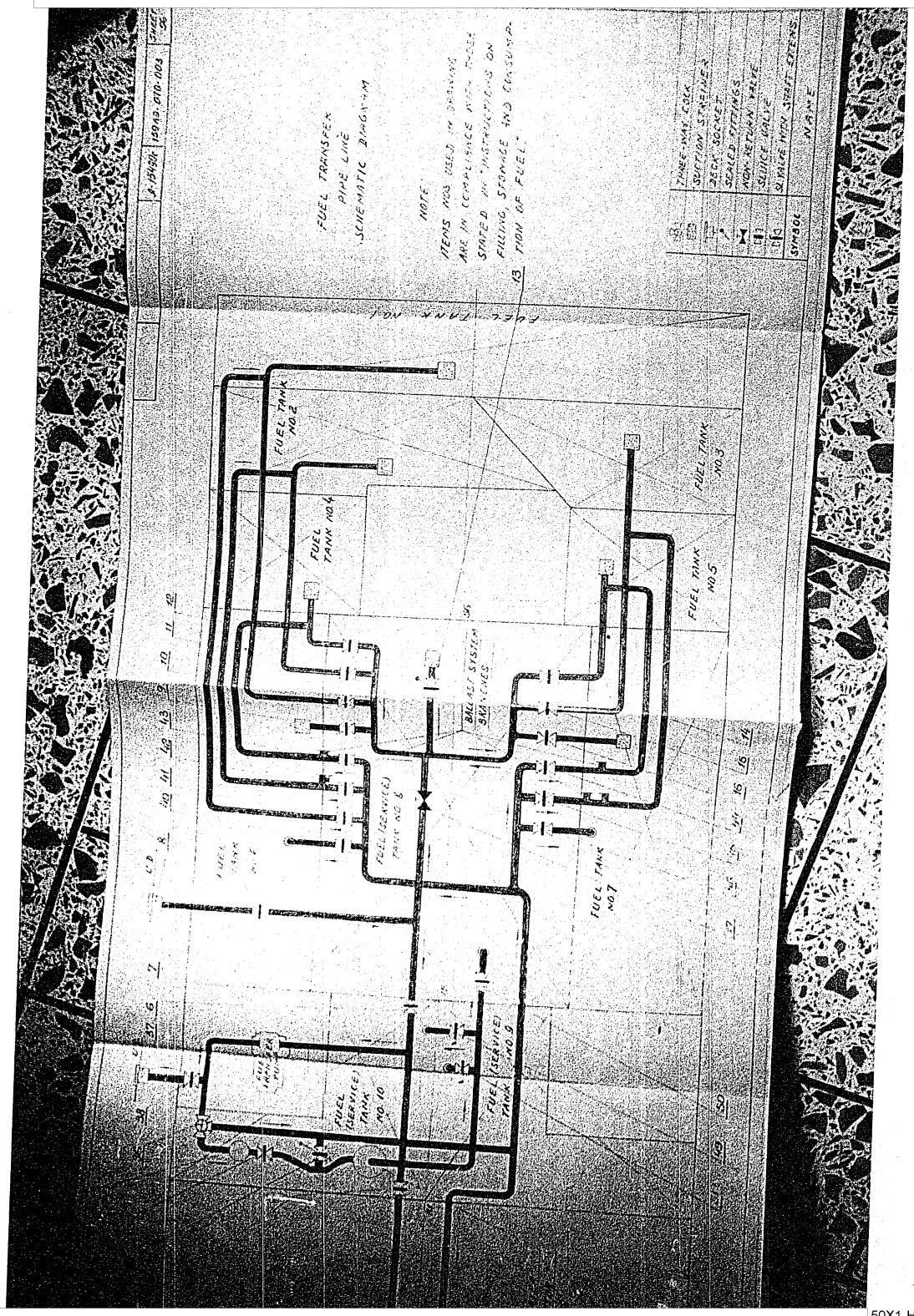
FUEL TRANSFER PIPE LINE SCHEMATIC DIAGRAM
NOTE
ITEMS NOS USED IN DRAWING ARE IN COMPLIANCE WITH MODEL STATED IN "INSTRUCTIONS ON FILLING, STORAGE AND CONSUMPTION OF FUEL"
FUEL TANK NO.1
FUEL TANK NO.2
FUEL TANK NO.4
FUEL TANK NO.5
FUEL TANK NO.7
FUEL (SERVICE) TANK NO.8
FUEL SERVICE TANK NO.9
FUEL SERVICE TANK NO.10
BALLAST SYSTEM
SYMBOL
NAME

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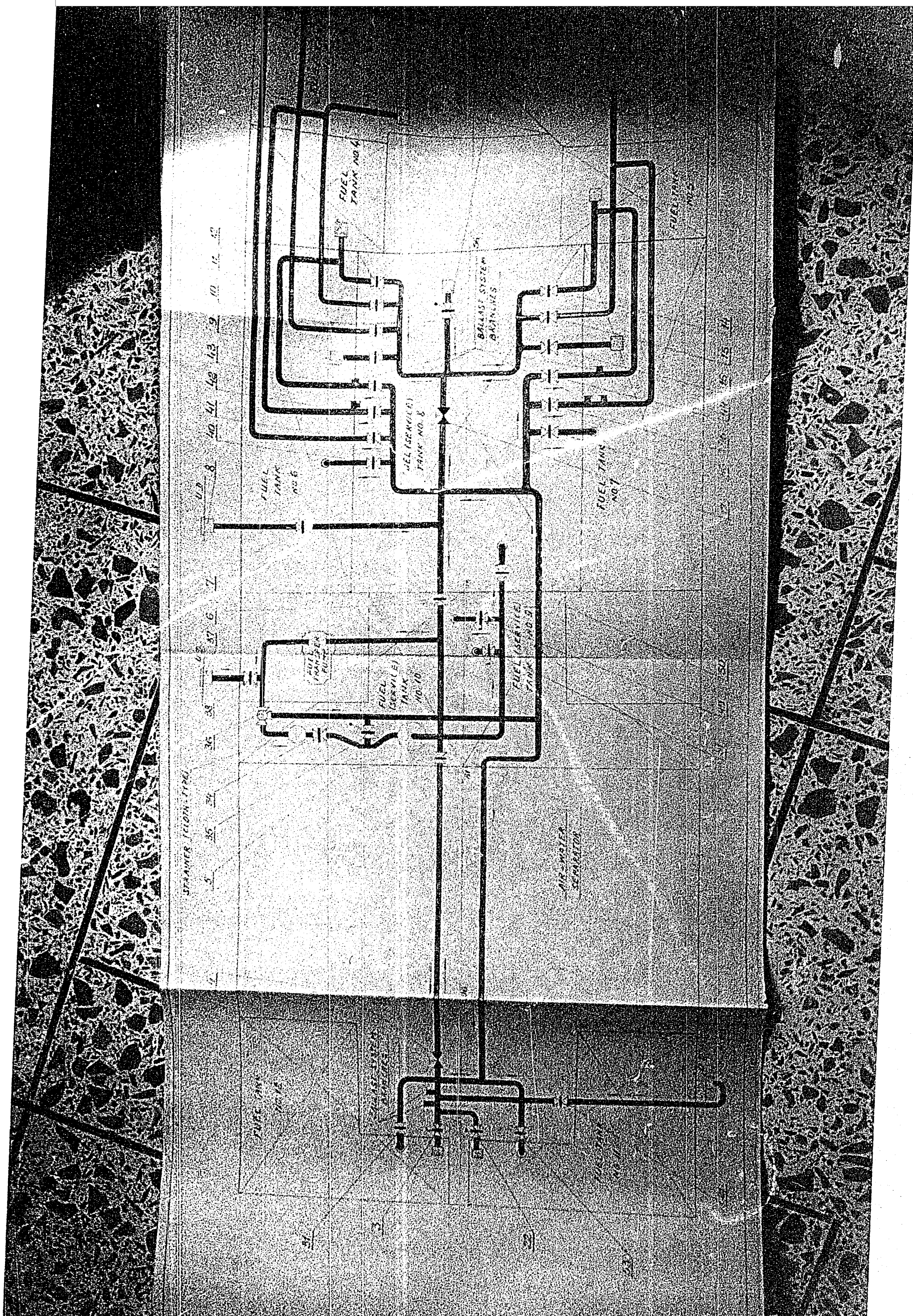

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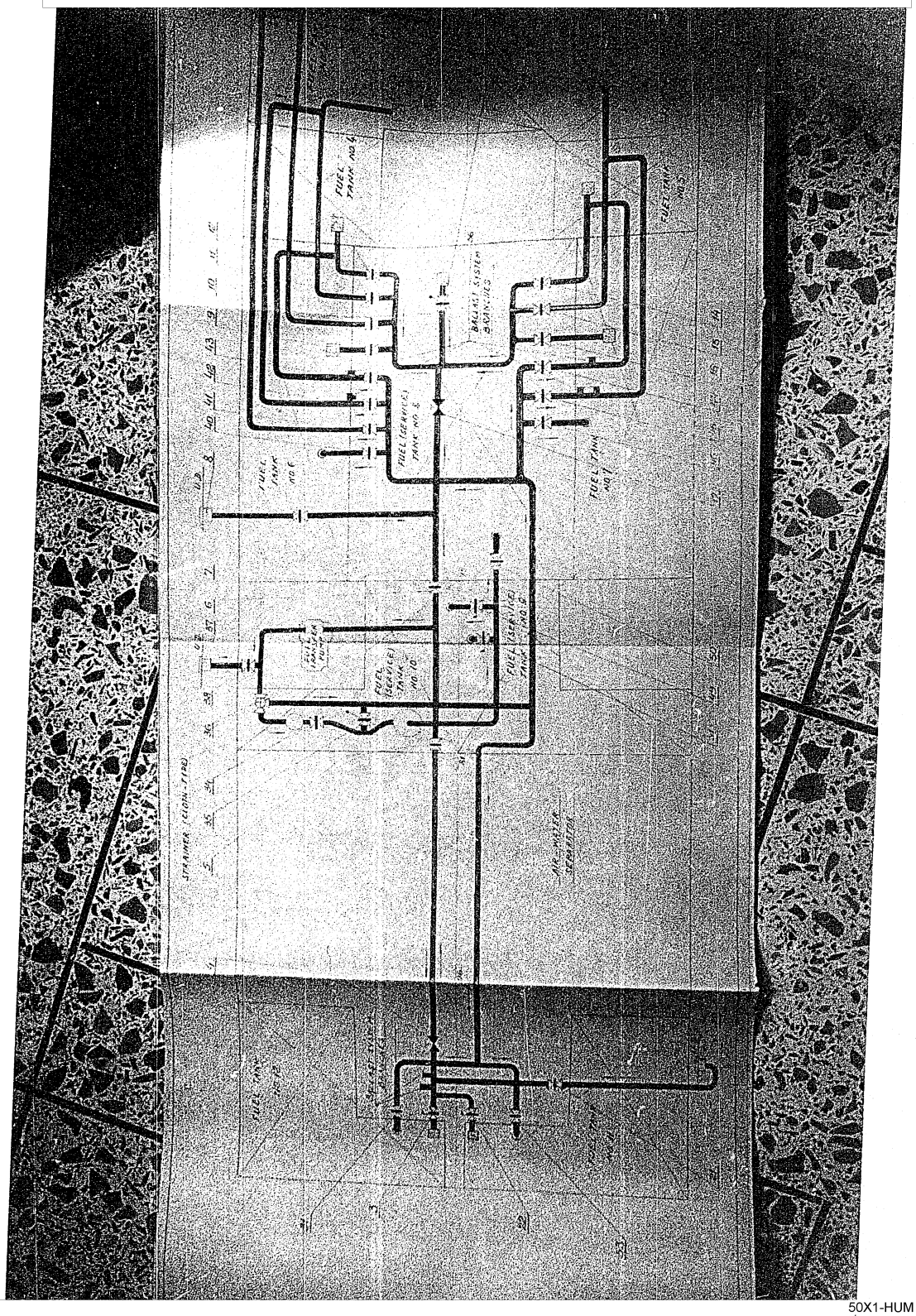
FUEL TANK NO 4
FUEL TANK NO 3
BALLAST SYSTEM BARNING
FUEL (SERVICE) TANK NO 5
FUEL TANK NO 6
FUEL TANK NO 1
FUEL (SERVICE) TANK NO 10
FUEL (SERVICE) TANK NO 9
STRAINER (FUEL OIL TYPE)
AIR-WATER SEPARATOR

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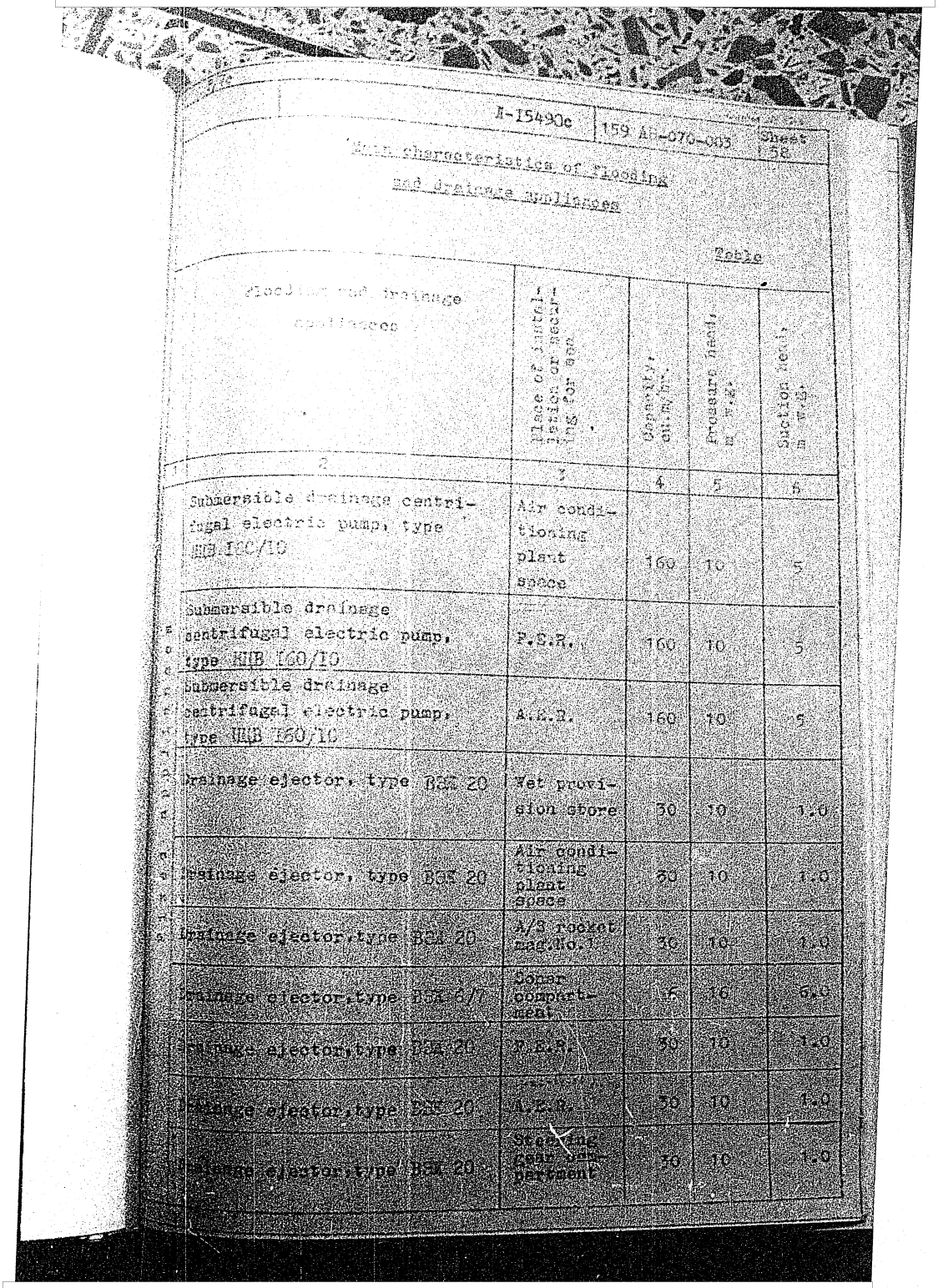

Main characteristics of flooding and drainage appliances

Table

Flooding and drainage appliances	Place of installation or securing for use	Capacity, cu.m/hr.	Pressure head, m w.g.	Suction head, m w.g.
1 2	3	4	5	6
Submersible drainage centrifugal electric pump, type ЦЦВ 160/10	Air conditioning plant space	160	10	5
Submersible drainage centrifugal electric pump, type ЦЦВ 160/10	P.E.R.	160	10	5
Submersible drainage centrifugal electric pump, type ЦЦВ 160/10	A.E.R.	160	10	5
Drainage ejector, type ВЭК 20	Wet provision store	30	10	1.0
Drainage ejector, type ВЭК 20	Air conditioning plant space	30	10	1.0
Drainage ejector, type ВЭК 20	A/S rocket mag.No.1	30	10	1.0
Drainage ejector, type ВЭК 6/7	Sonar compartment	6	16	6.0
Drainage ejector, type ВЭК 20	P.E.R.	30	10	1.0
Drainage ejector, type ВЭК 20	A.E.R.	30	10	1.0
Drainage ejector, type ВЭК 20	Steering gear compartment	30	10	1.0

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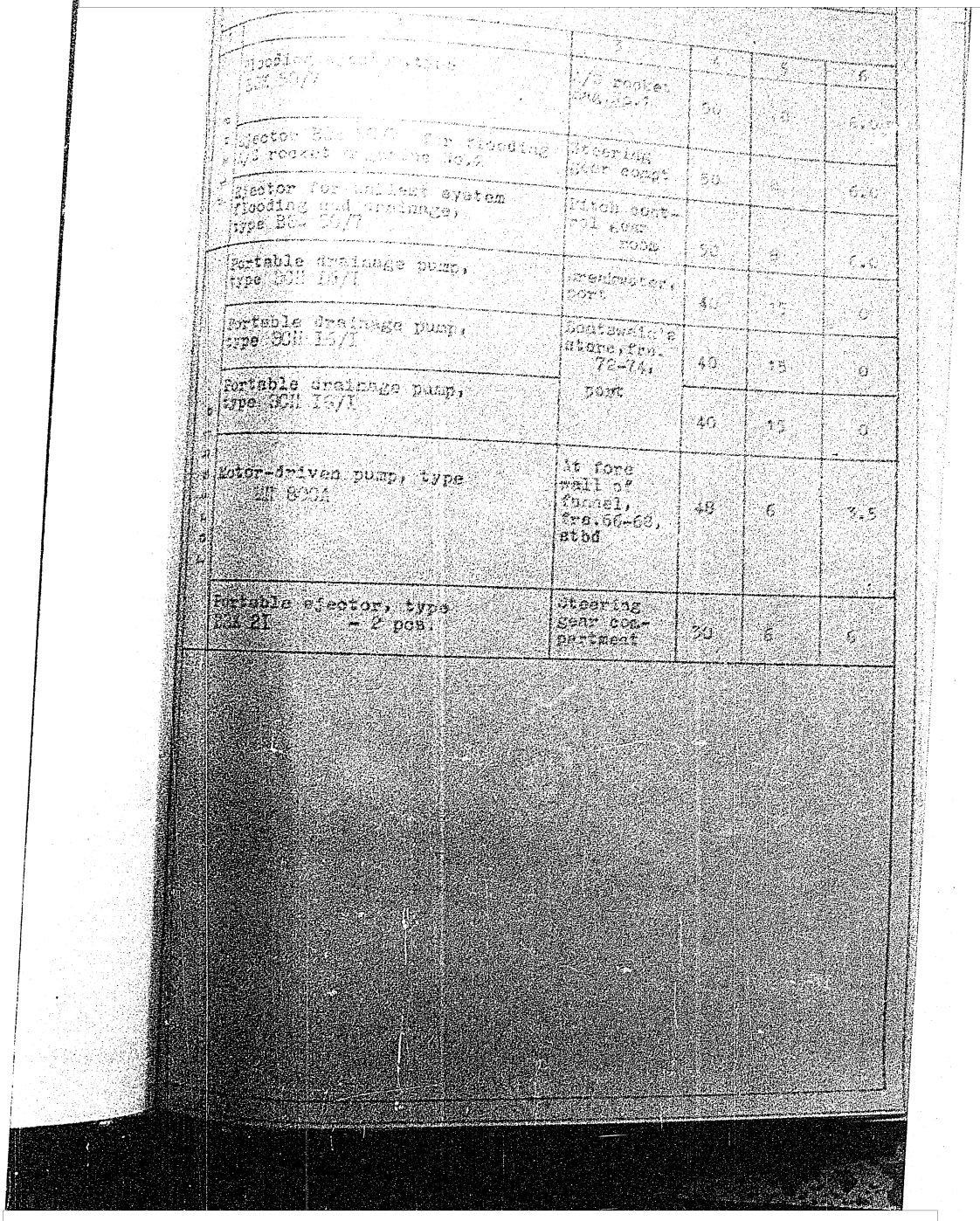

1	2	3	4	5	6
	Flooding ejector, type BSK 50/7	A/S rocket mag. No.1	50	8	6.0
	Ejector BSK 50/7 for flooding A/S rocket magazine No.2	Steering gear compt.	50	8	6.0
	Ejector for ballast system flooding and drainage, type BSK 50/7	Pitch control gear room	50	8	6.0
	Portable drainage pump, type SCH 16/I	Breakwater, port	40	15	0
	Portable drainage pump, type SCH 16/I	Boatswain's store, frs. 72-74, port	40	15	0
	Portable drainage pump, type SCH 16/I		40	15	0
	Motor-driven pump, type ЭН 800А	At fore wall of funnel, frs. 66-68, stbd	48	6	3.5
	Portable ejector, type BSK 2I - 2 pcs.	Steering gear compartment	30	6	6

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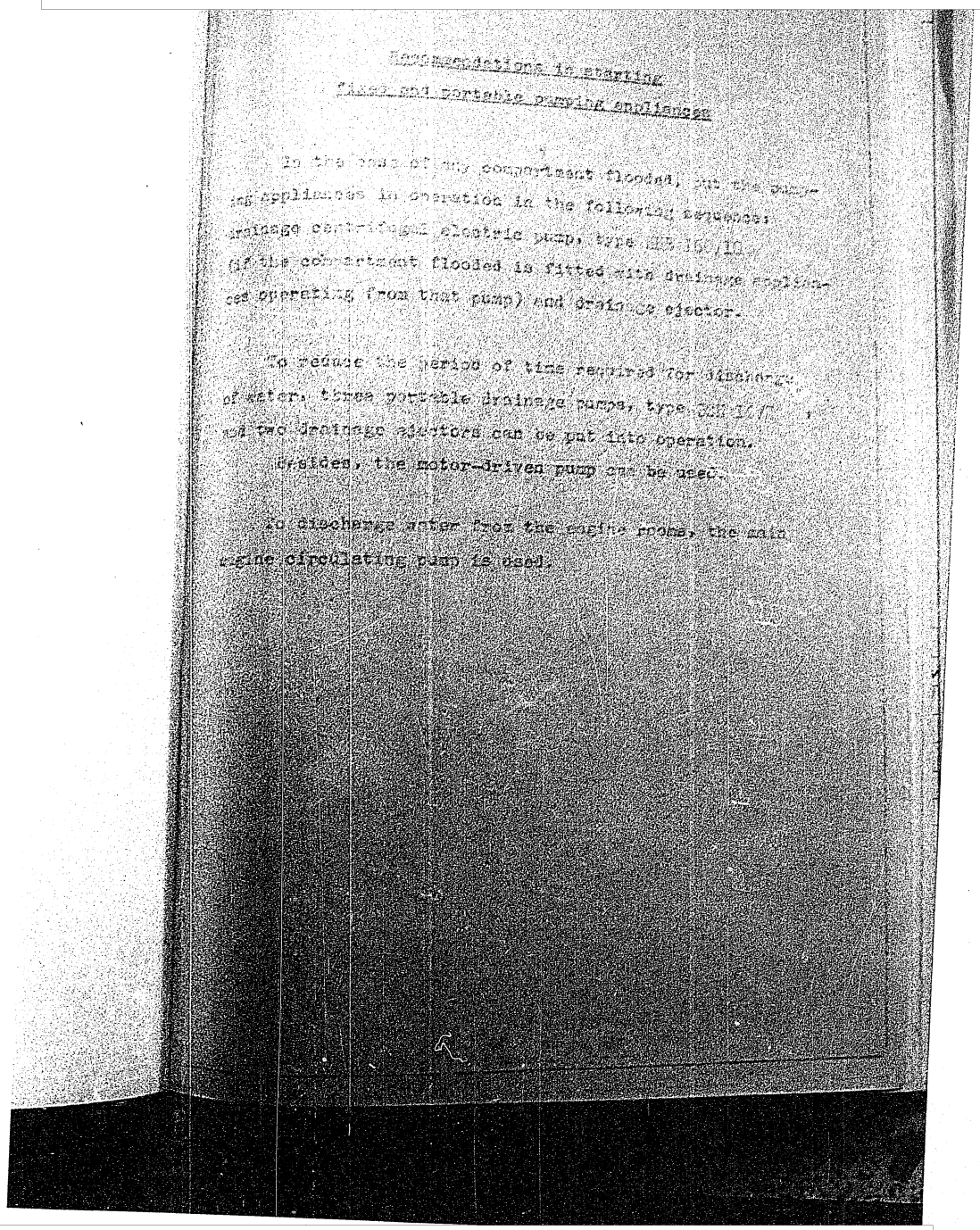

Recommendations in steering
fixed and portable pumping appliances

In the case of any compartment flooded, put the pumping appliances in operation in the following sequence:
drainage centrifugal electric pump, type [illegible]
(if the compartment flooded is fitted with drainage appliances operating from that pump) and drain ejector.

To reduce the period of time required for discharge of water, three portable drainage pumps, type [illegible], and two drainage ejectors can be put into operation.

Provided, the motor-driven pump can be used.

To discharge water from the engine rooms, the main engine circulating pump is used.

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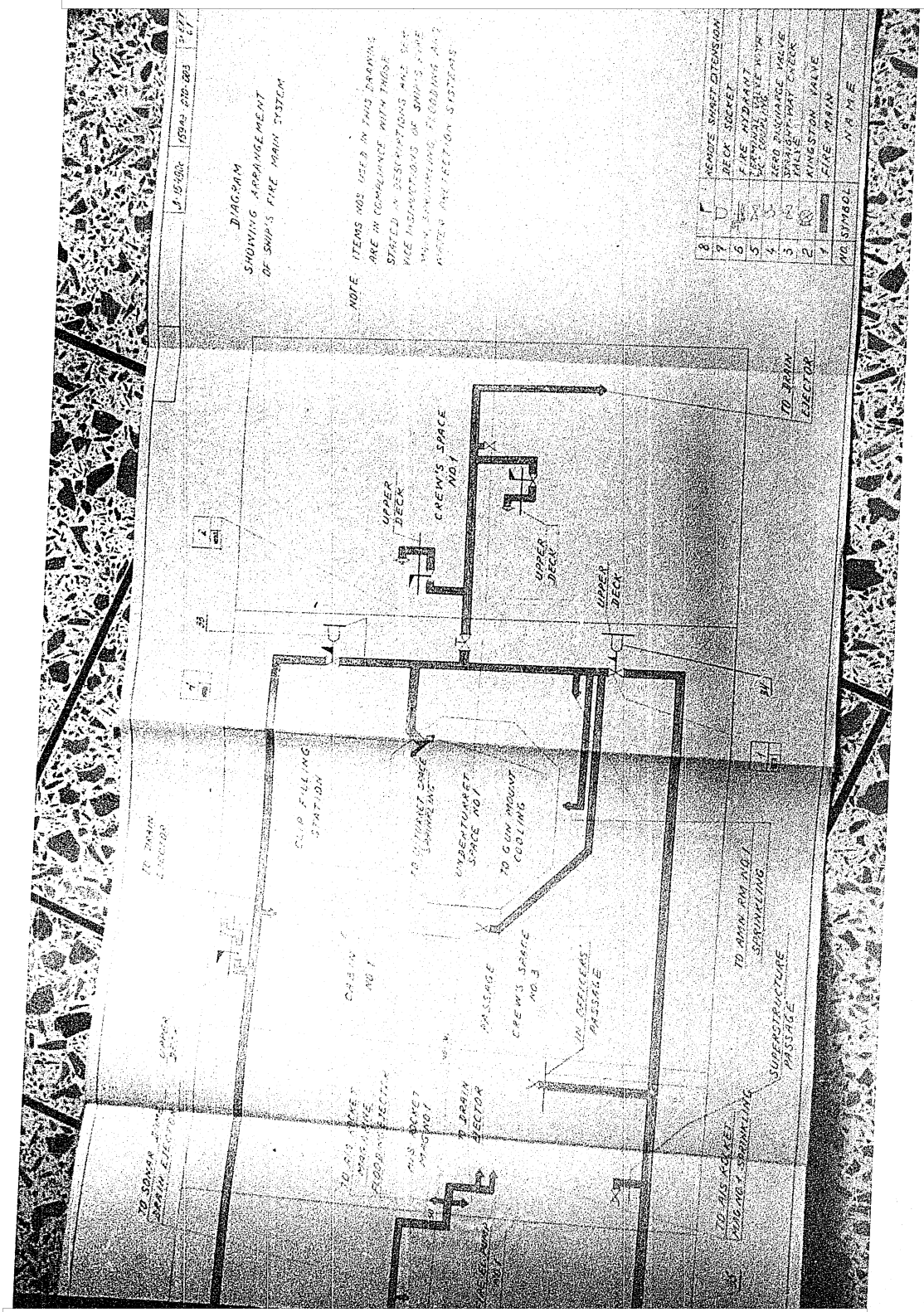

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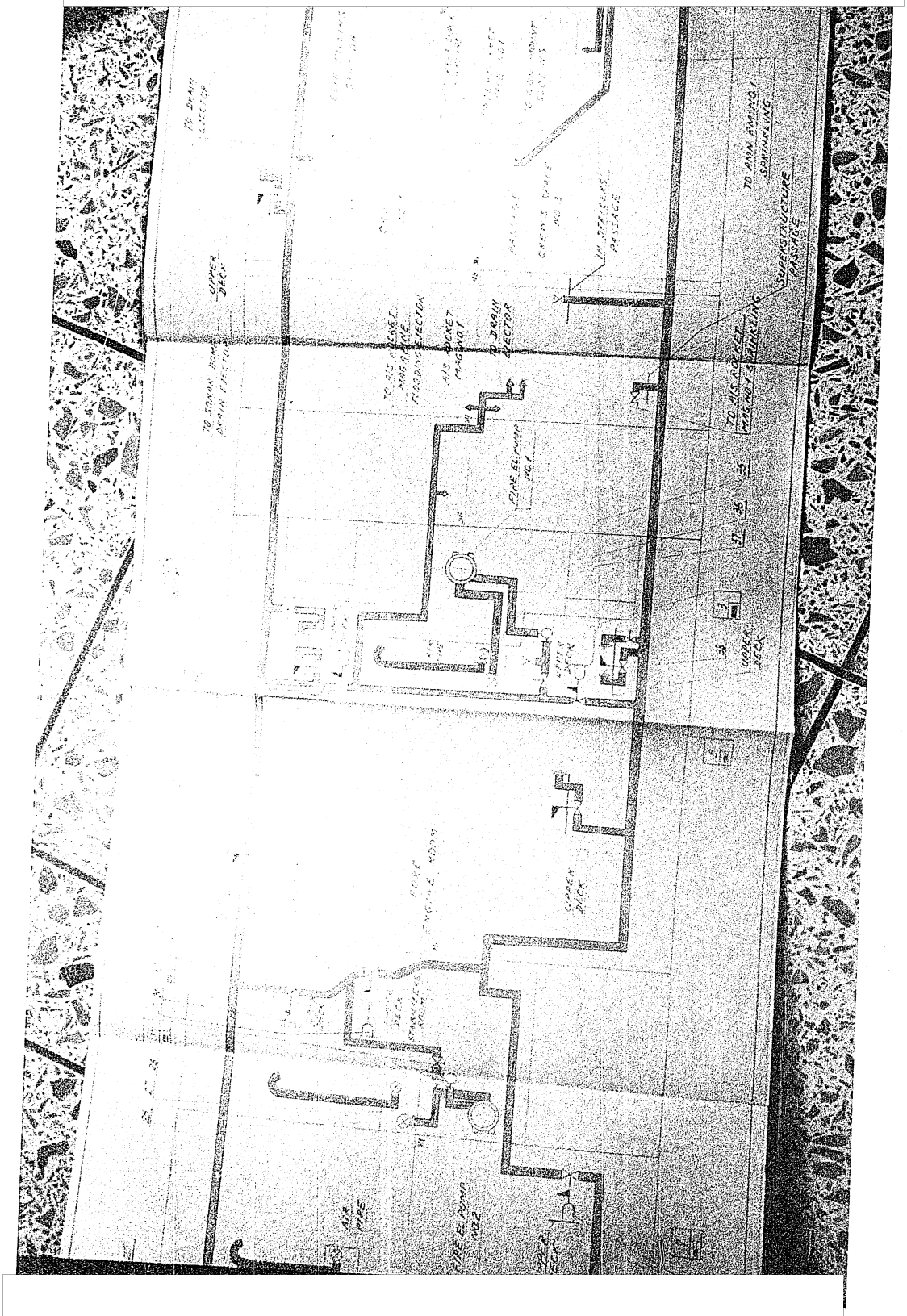

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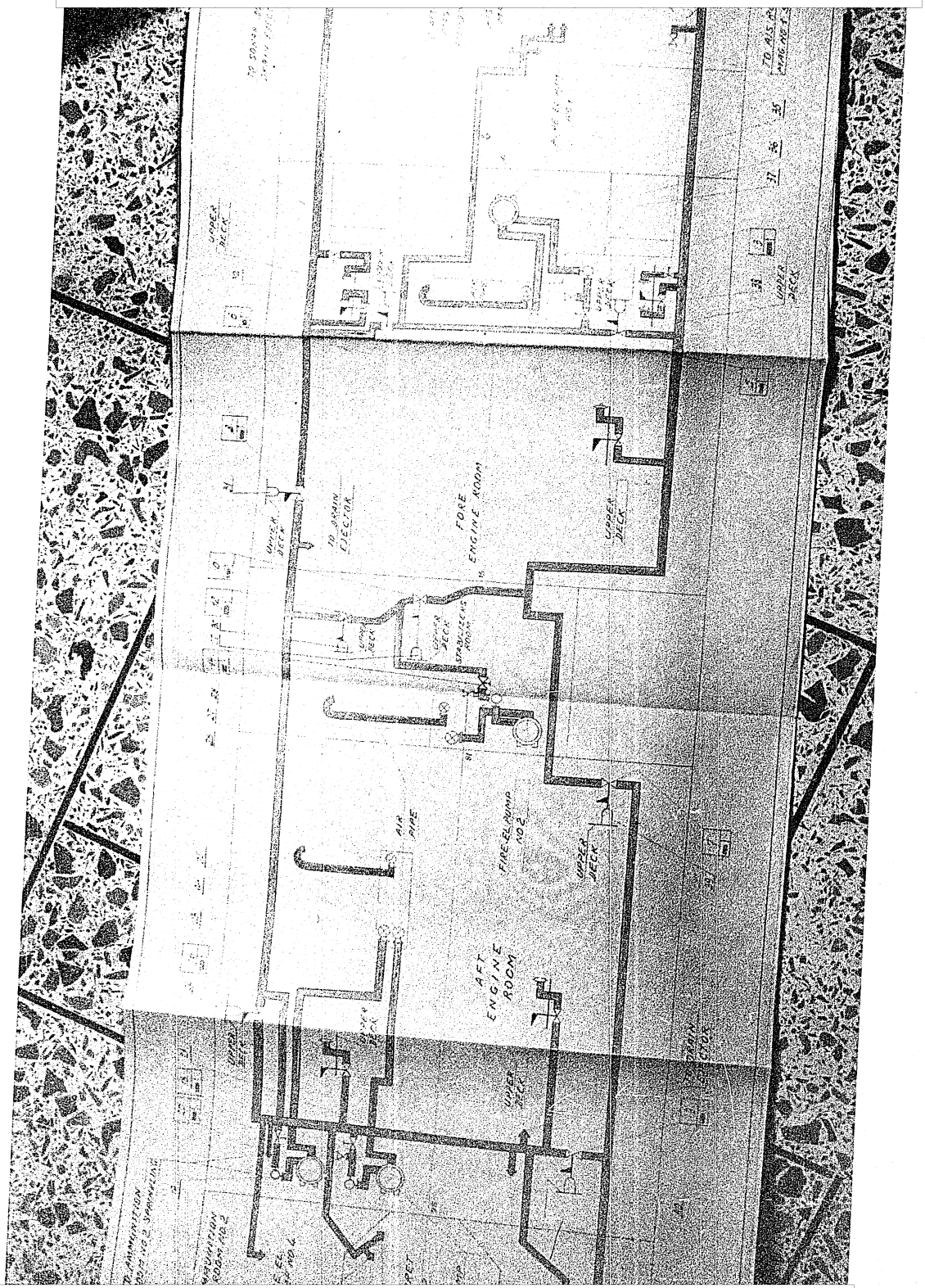

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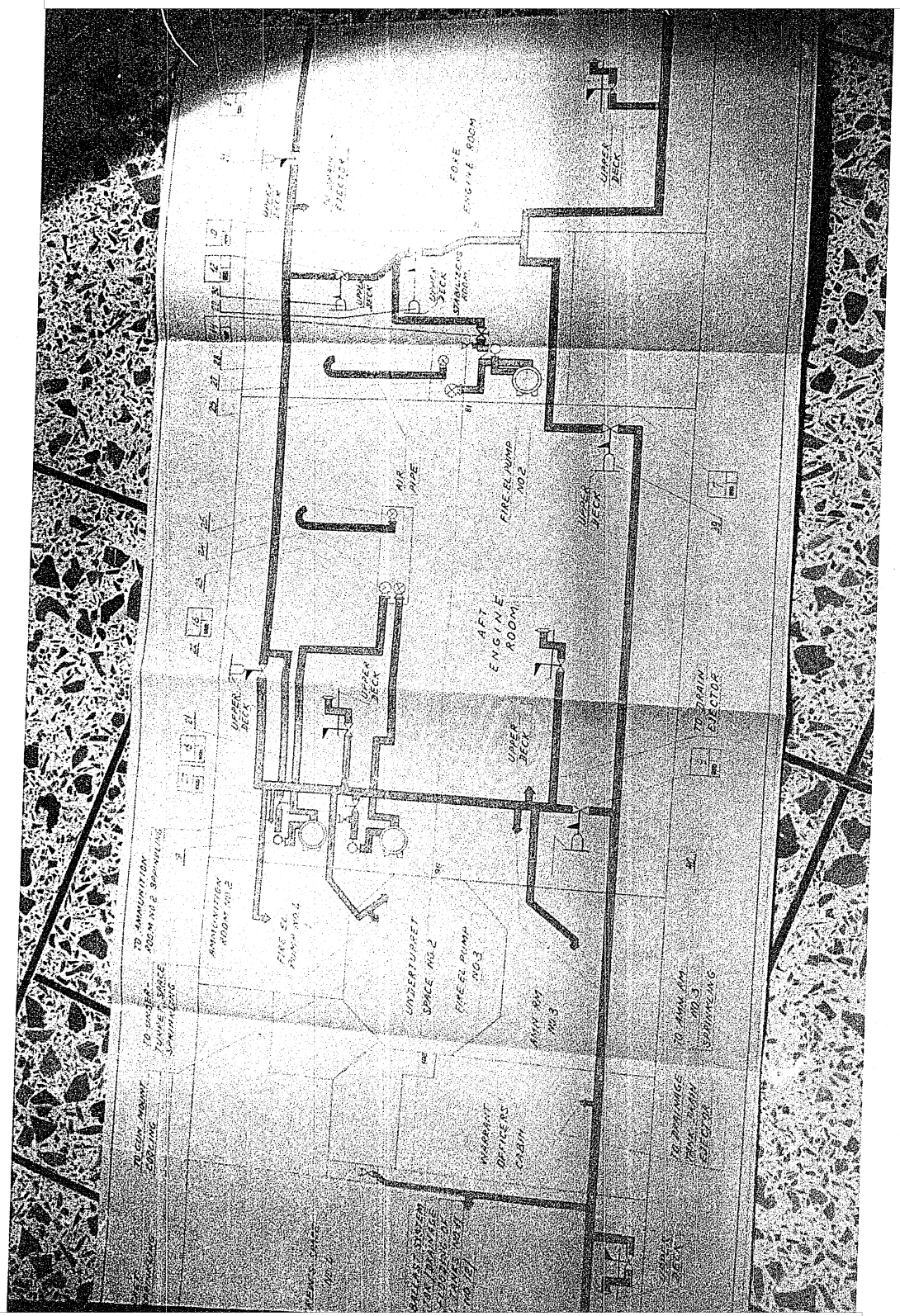

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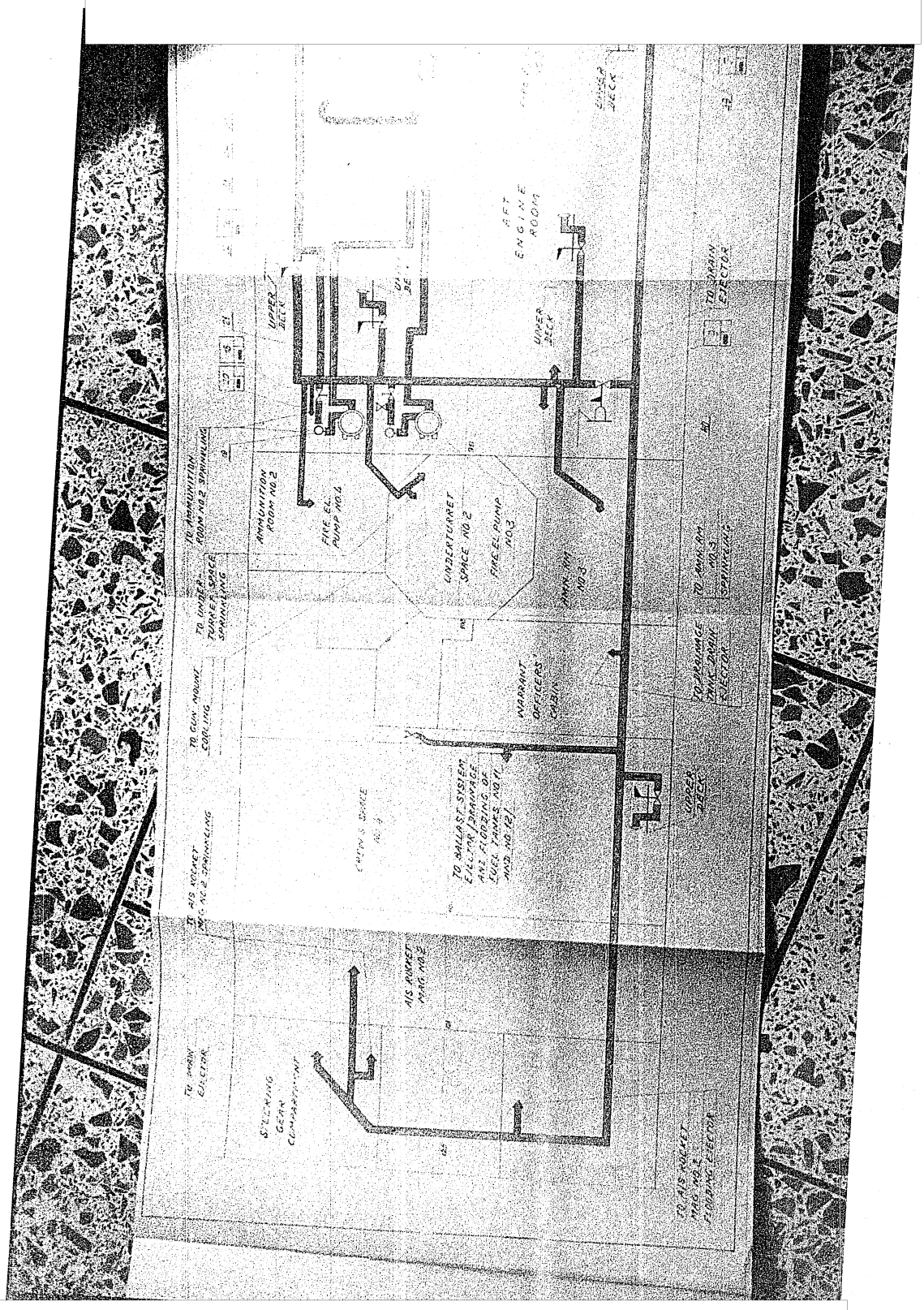
AMMUNITION ROOM NO 2
TO AMMUNITION ROOM NO 2 SPRINKLING
TO UNDER TURRET SPACE SPRINKLING
TO GUN HOUST CONTROL
AIR HOUSET FOR NO 2 SPRINKLING
TO MAIN EJECTOR
STEERING GEAR COMPARTMENT
FIRE EL PUMP NO 4
UNDERTURRET SPACE NO 2
FIRE EL PUMP NO 3
EMER. PUMP NO 3
WARRANT OFFICERS CABIN
TO BALLAST SYSTEM EJECTOR DRAINAGE AND FLOODING OF FUEL TANKS NO 11 AND NO 12
AIR HOUSET FOR NO 1 SPRINKLING
TO MAIN EJECTOR
TO DRAINAGE AND BALLAST EJECTOR
TO AIR HOUSET FOR NO 2 SPRINKLING
TO MAIN EJECTOR
AFT ENGINE ROOM
UPPER DECK
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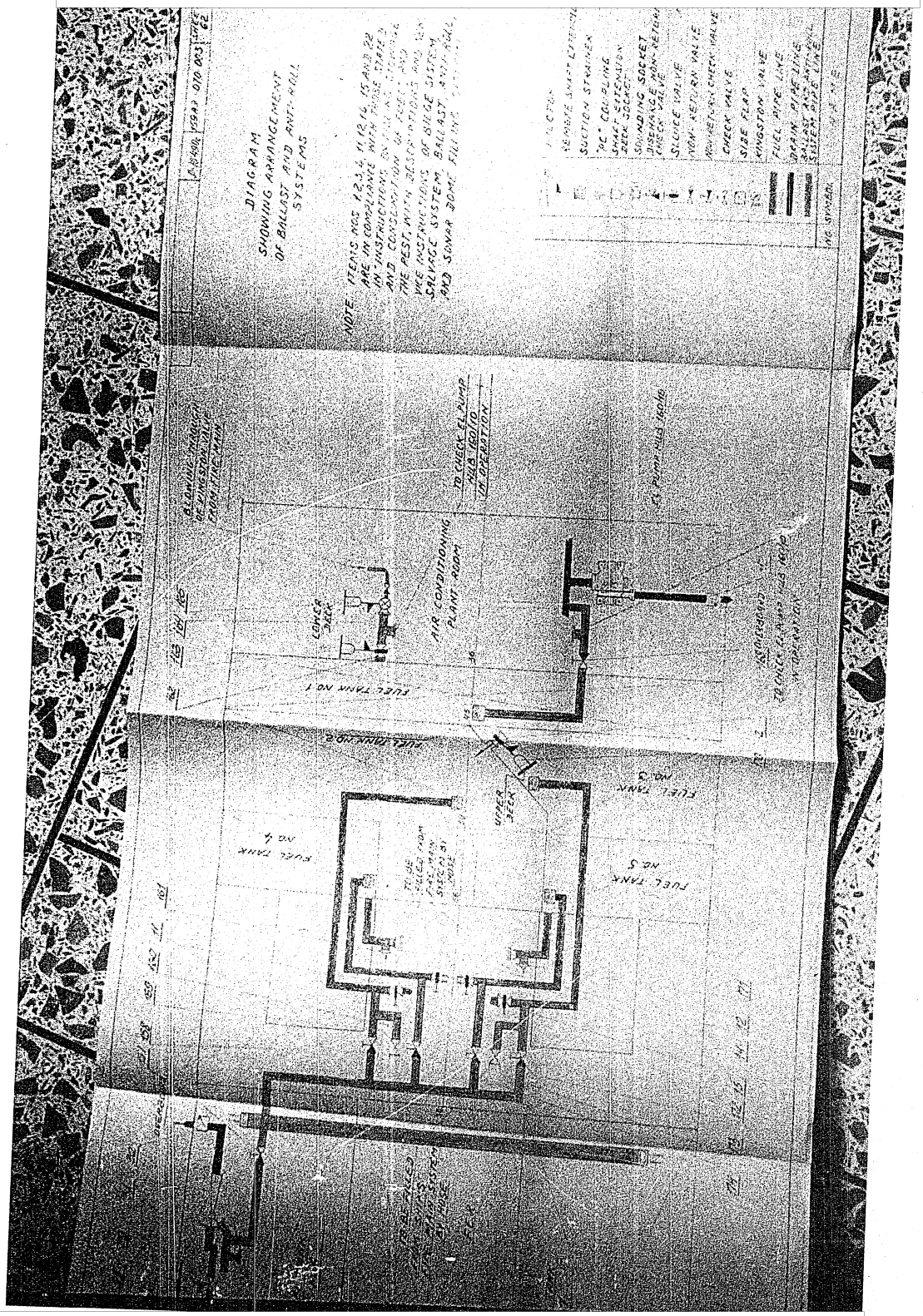

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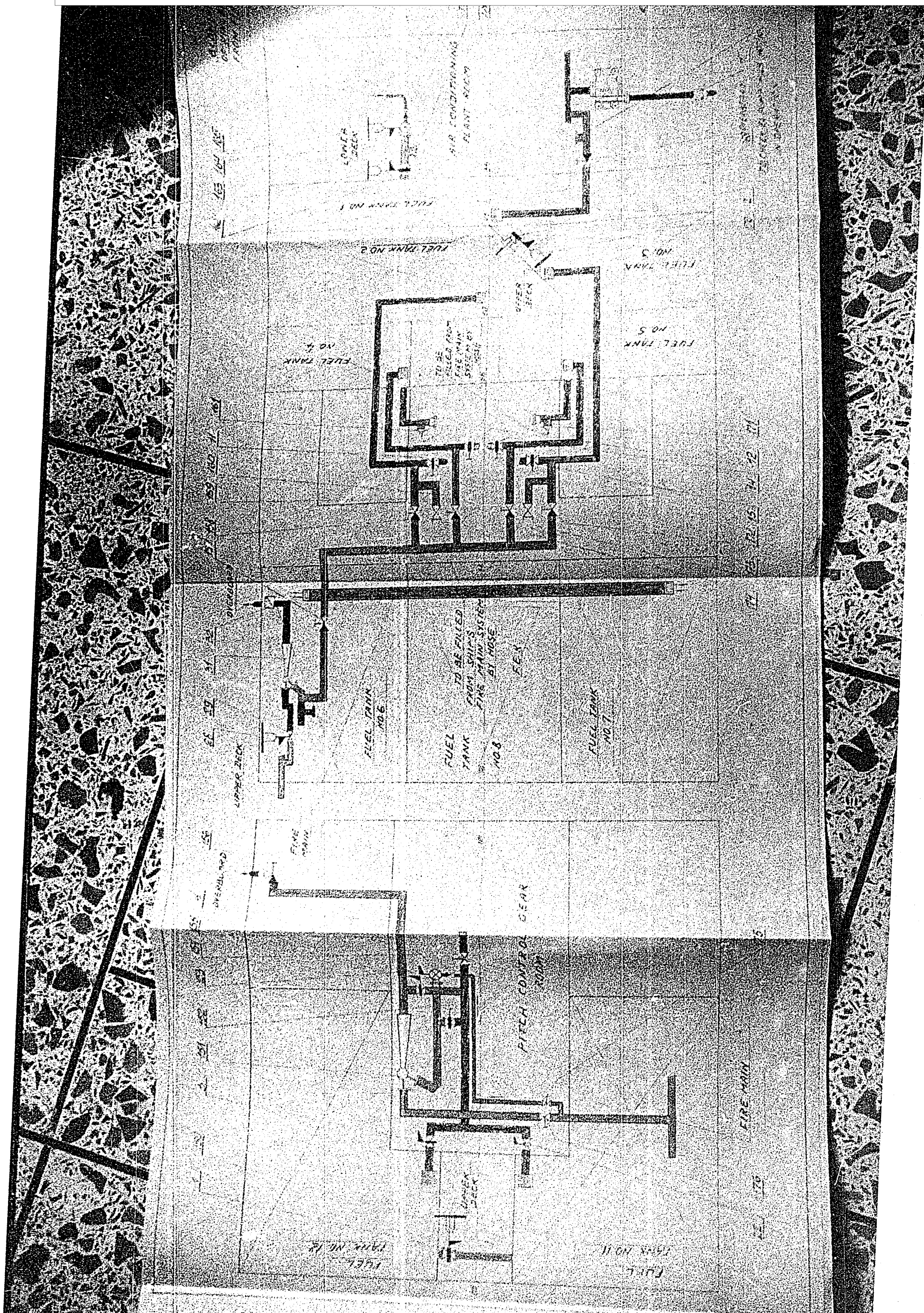

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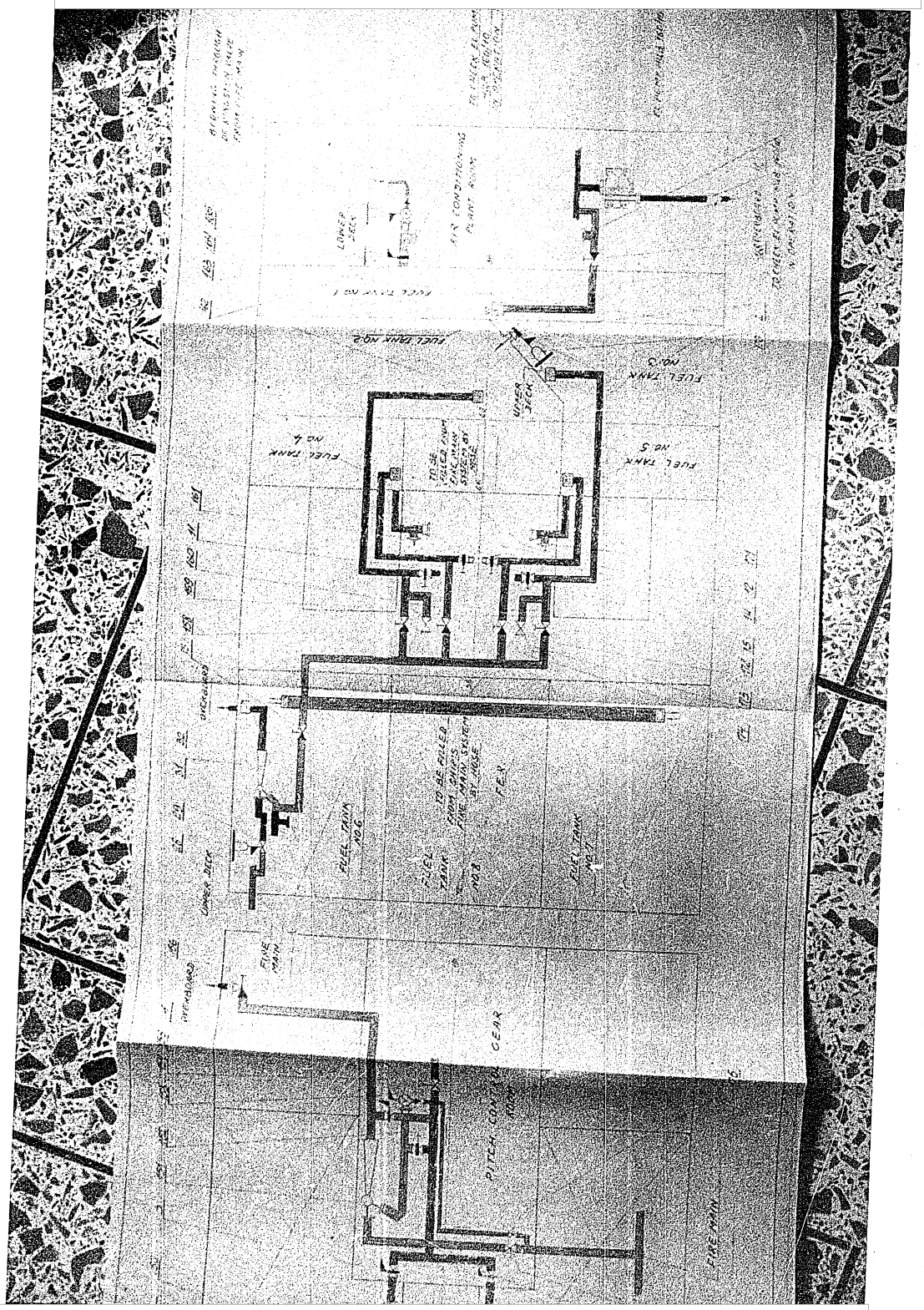

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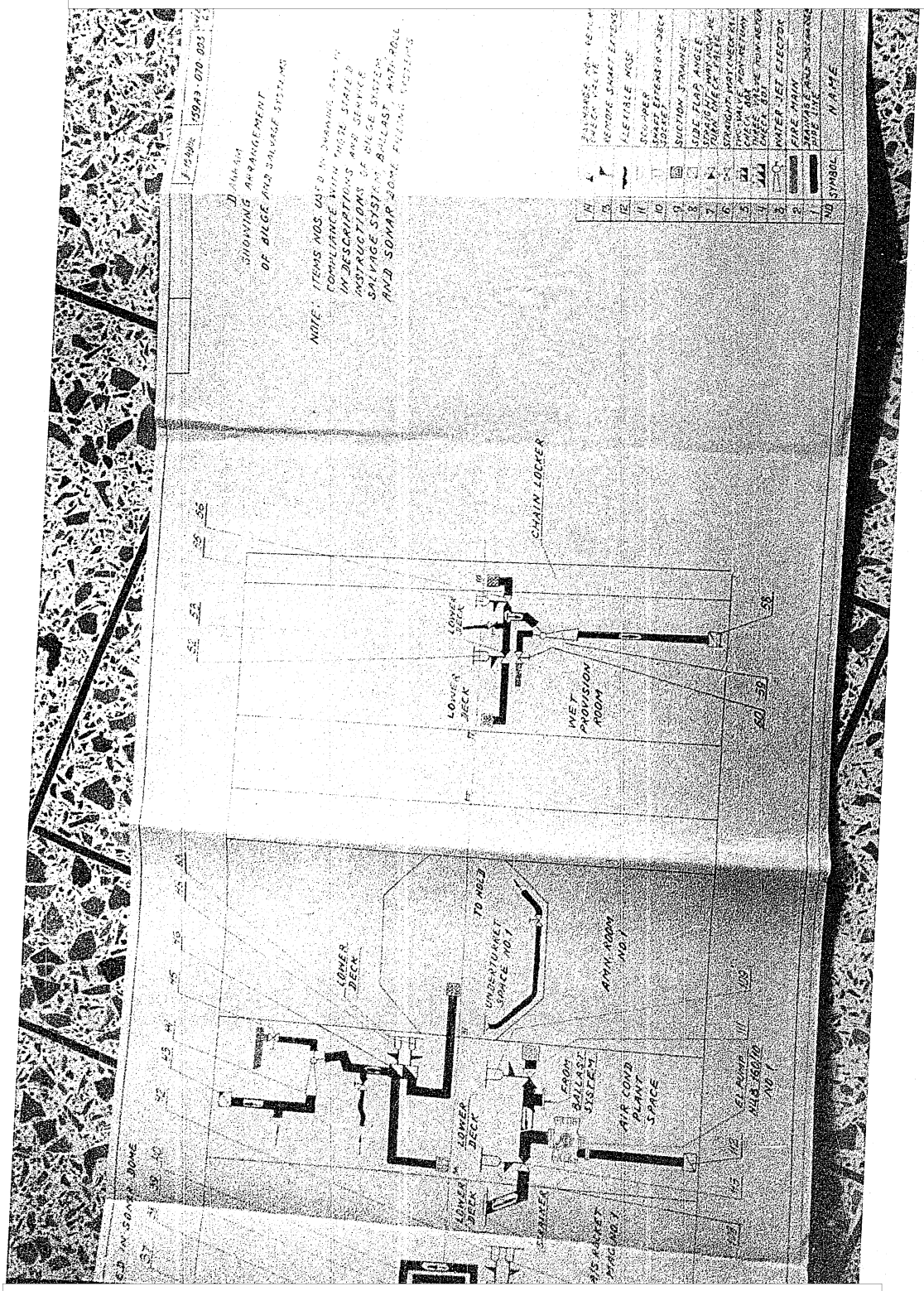

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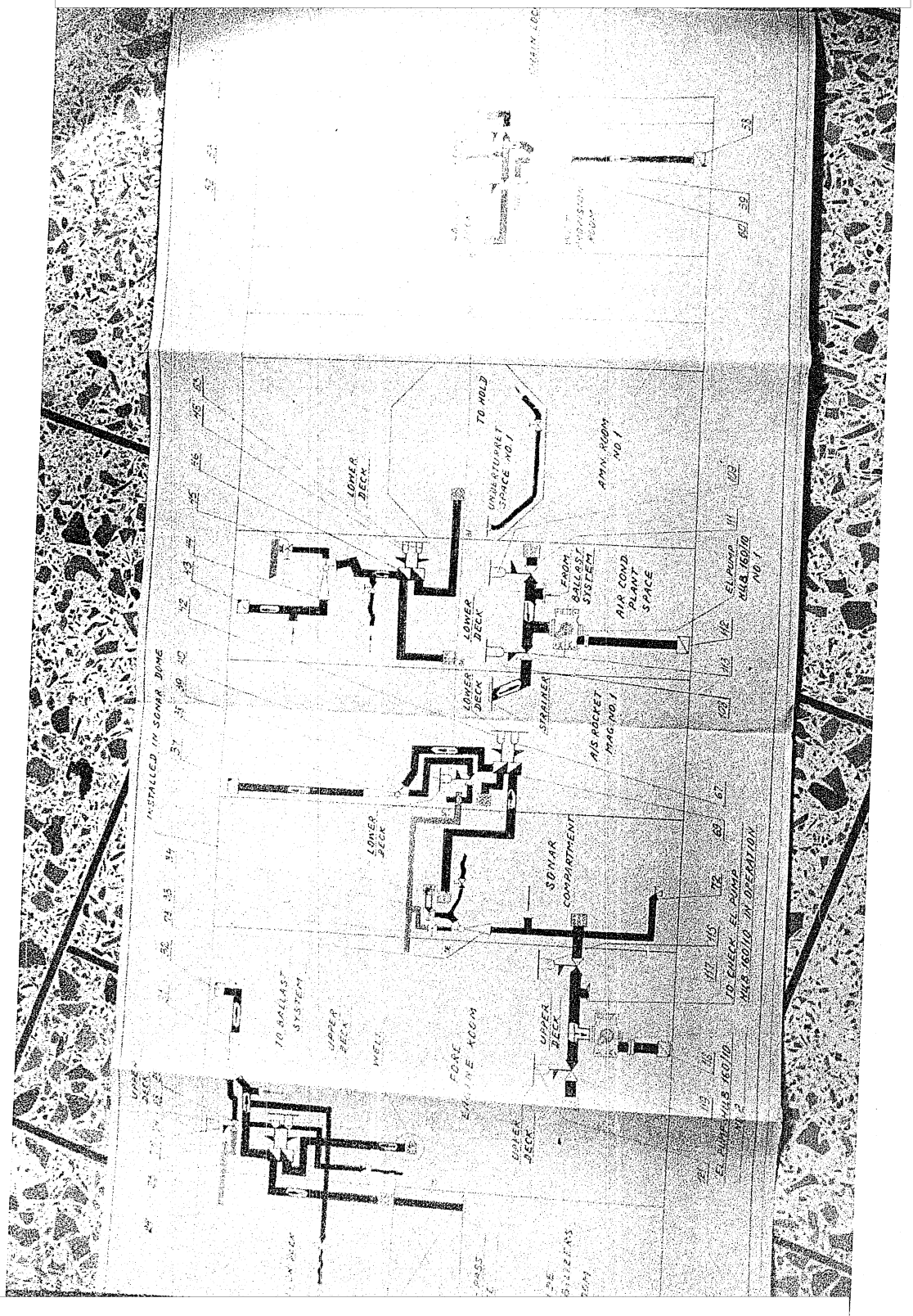

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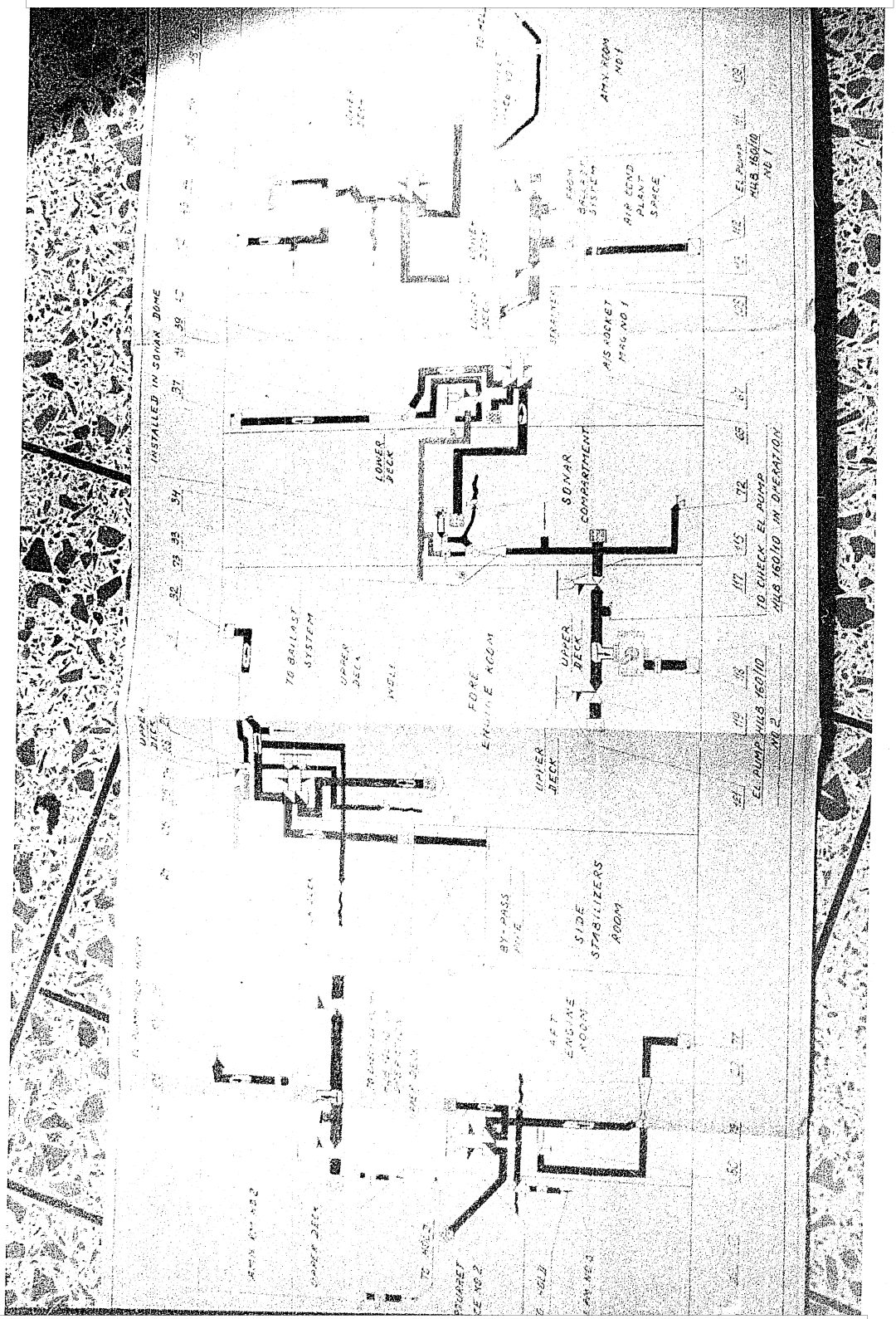

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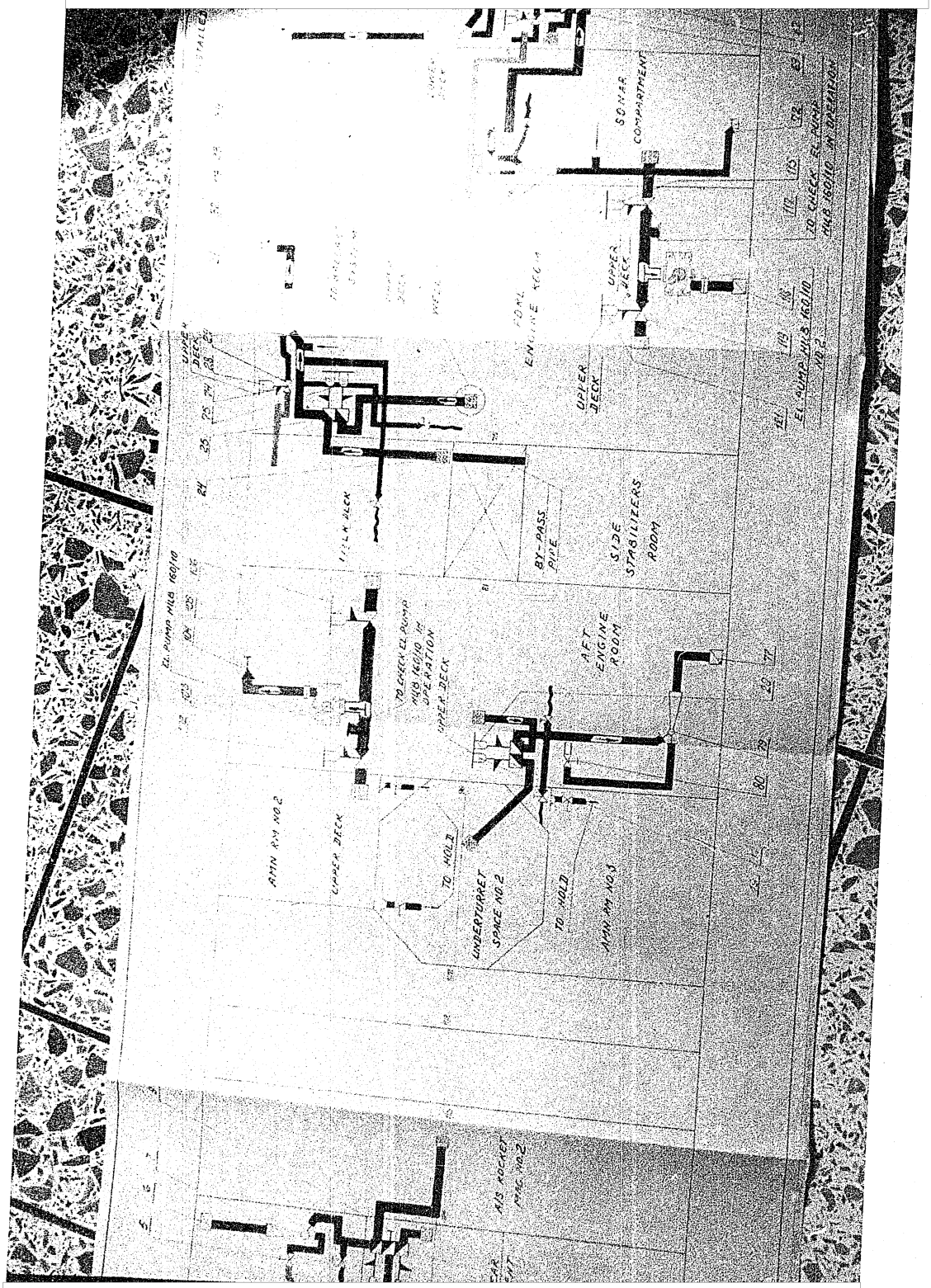

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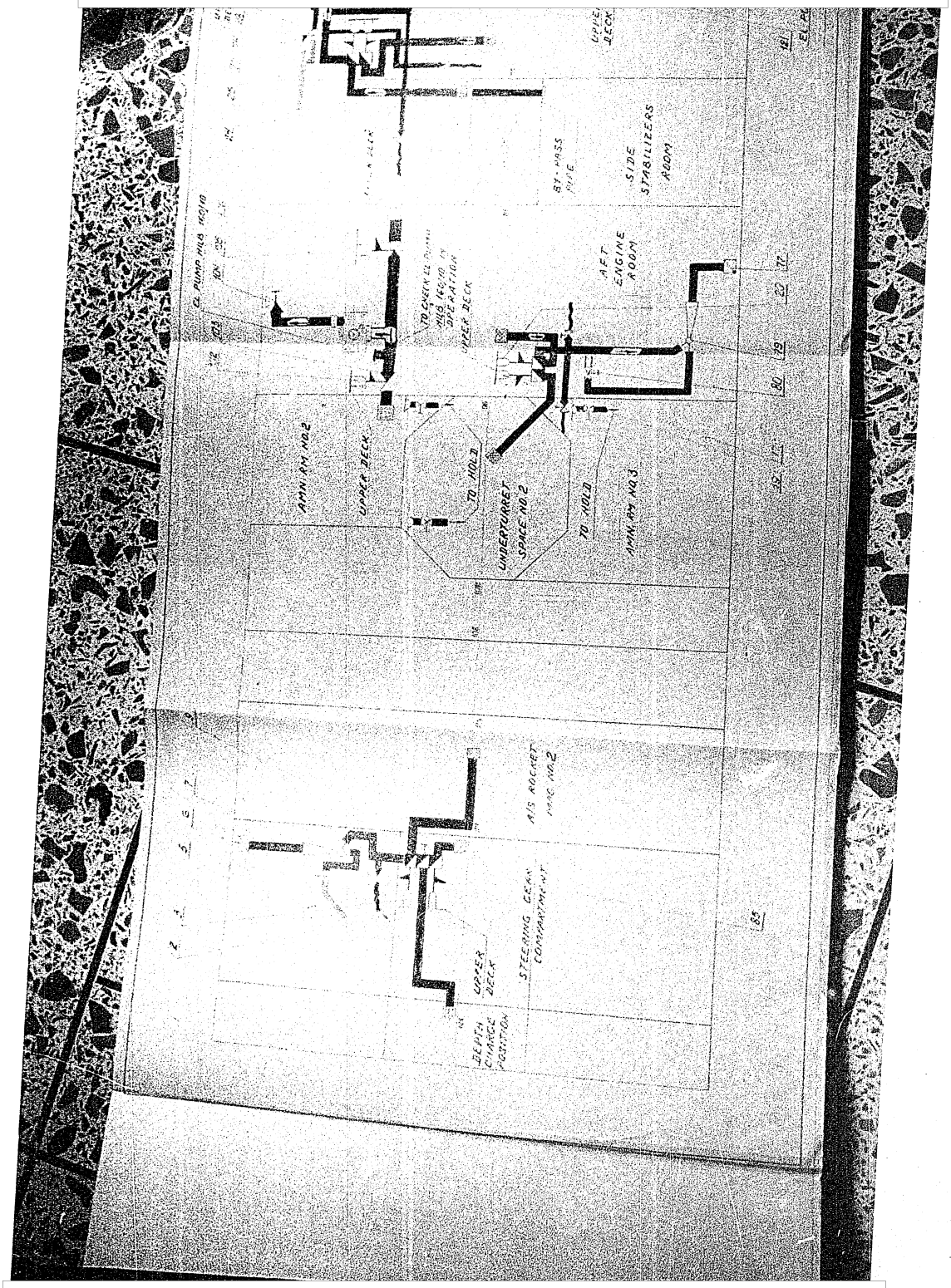

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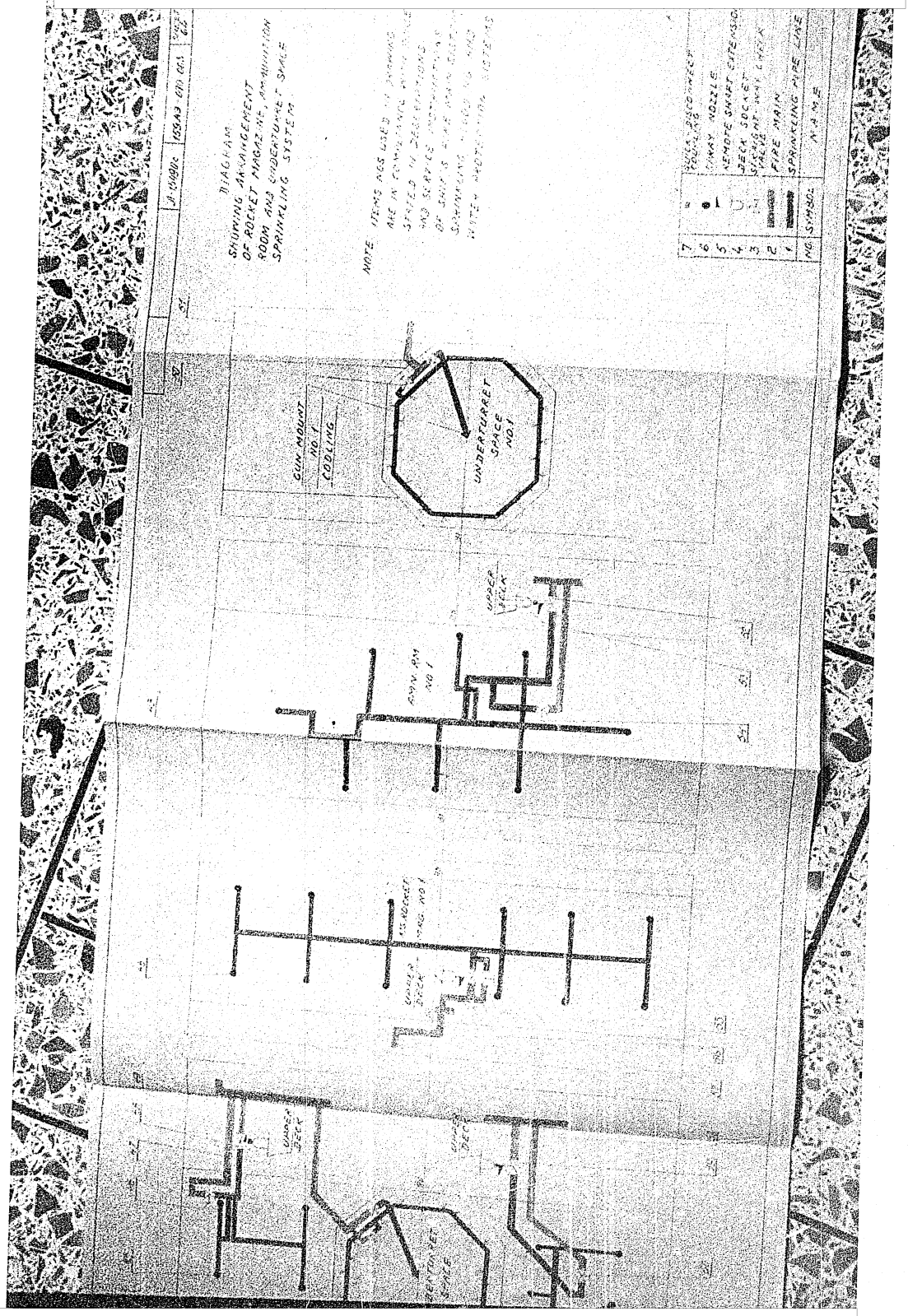

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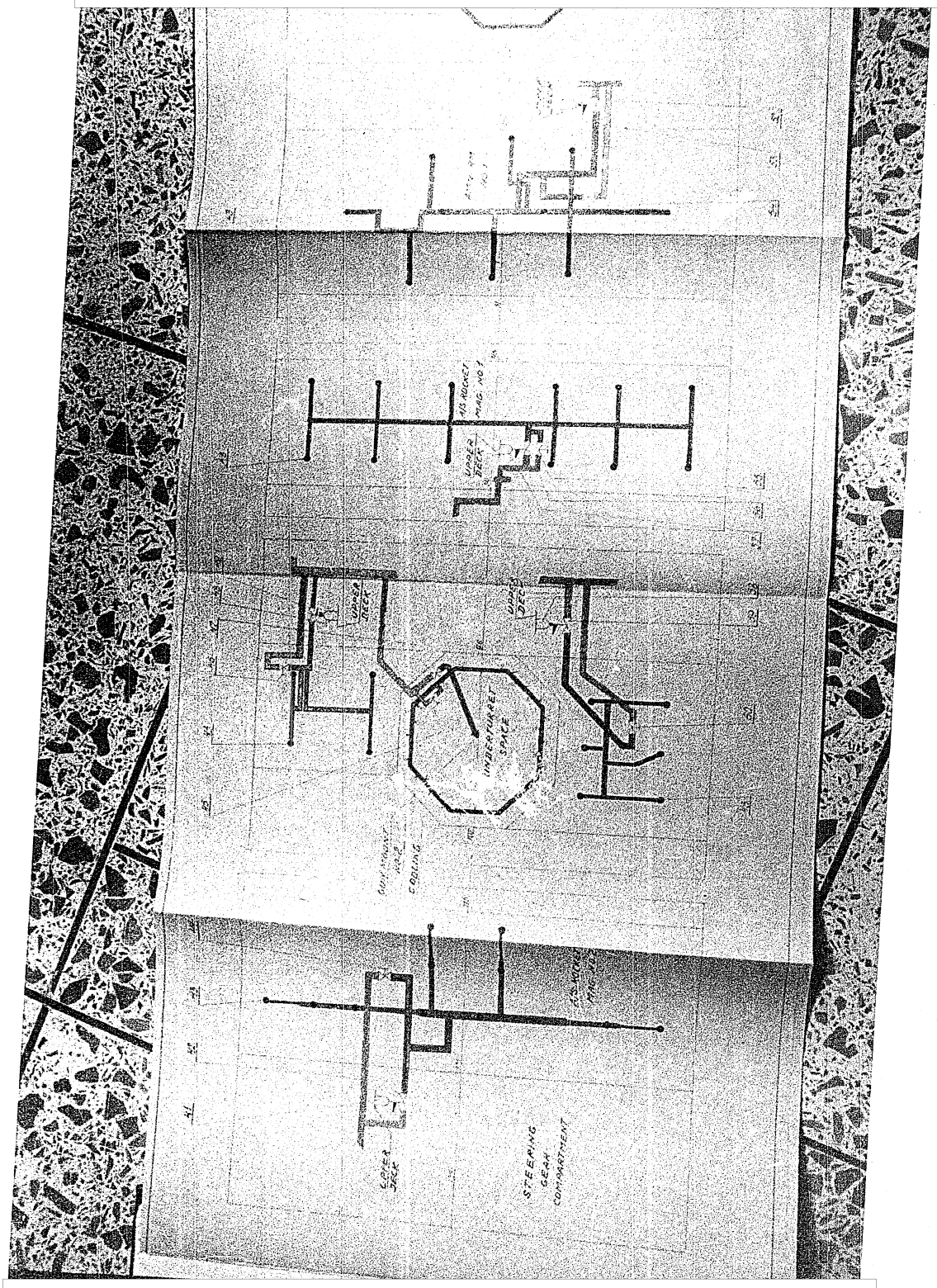

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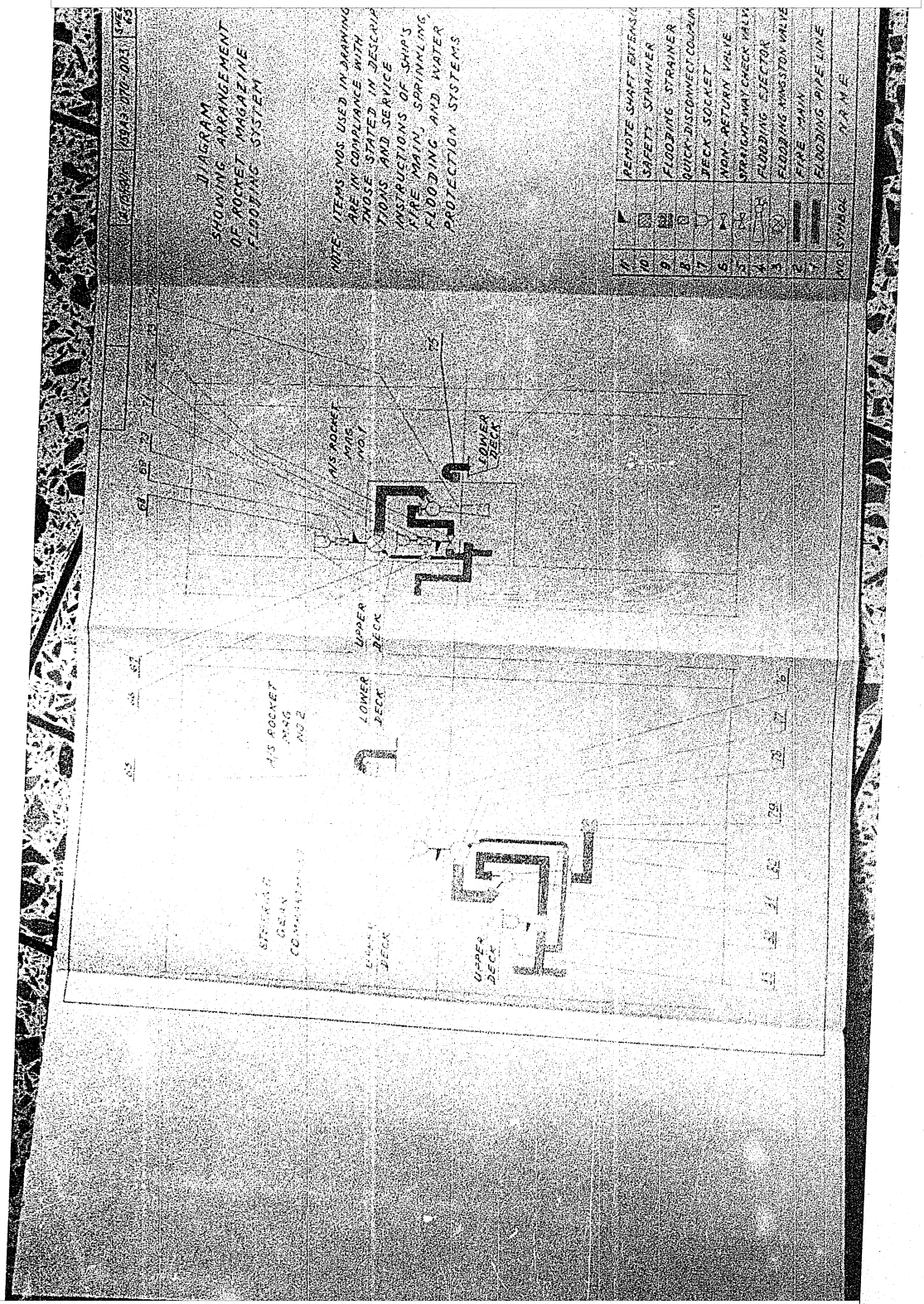

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DIAGRAM
SHOWING ARRANGEMENT OF VENTILATION
AND SPEAKING TUBE FITTINGS MOUNTED
ON WATERTIGHT STRUCTURES

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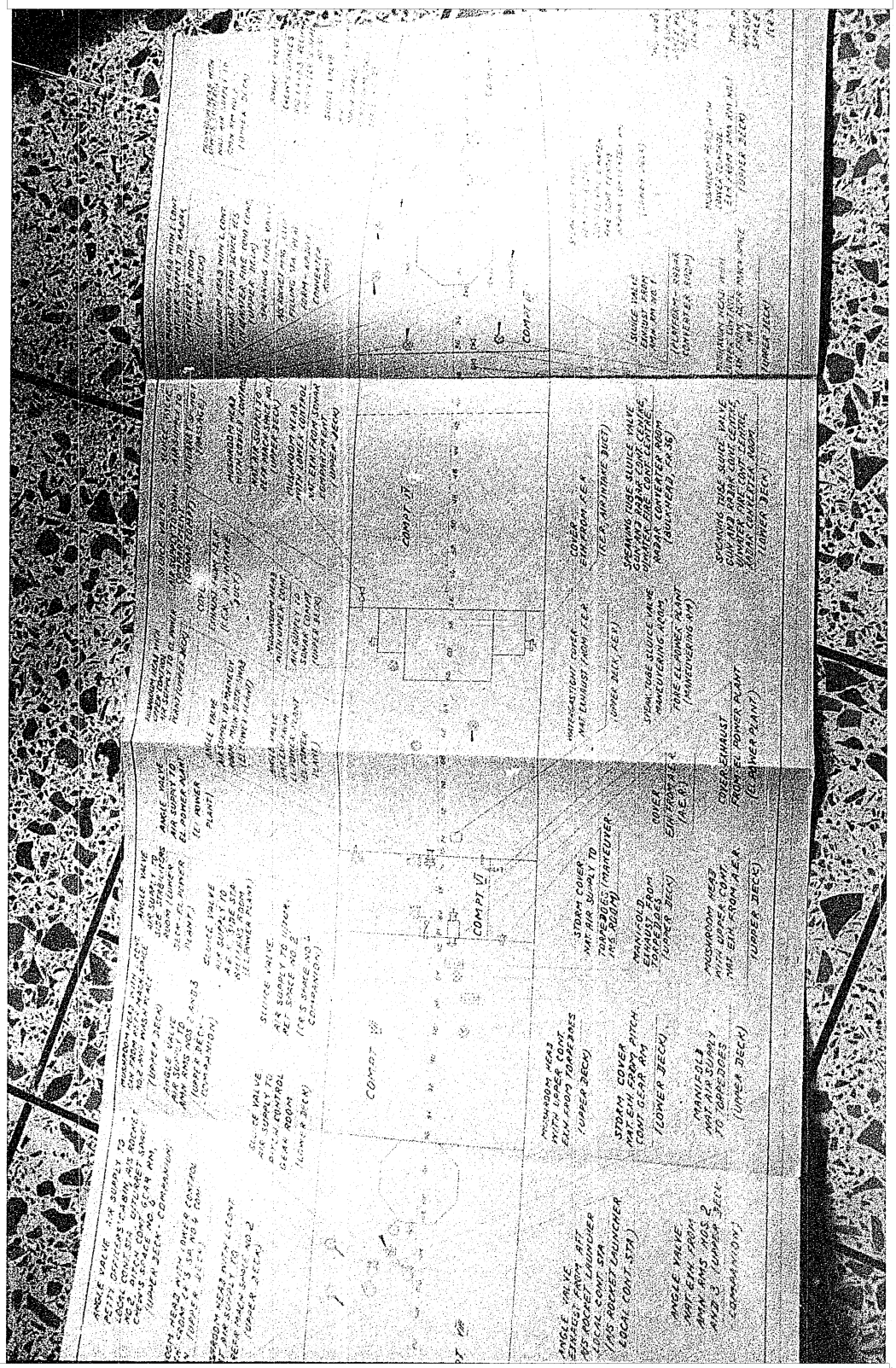

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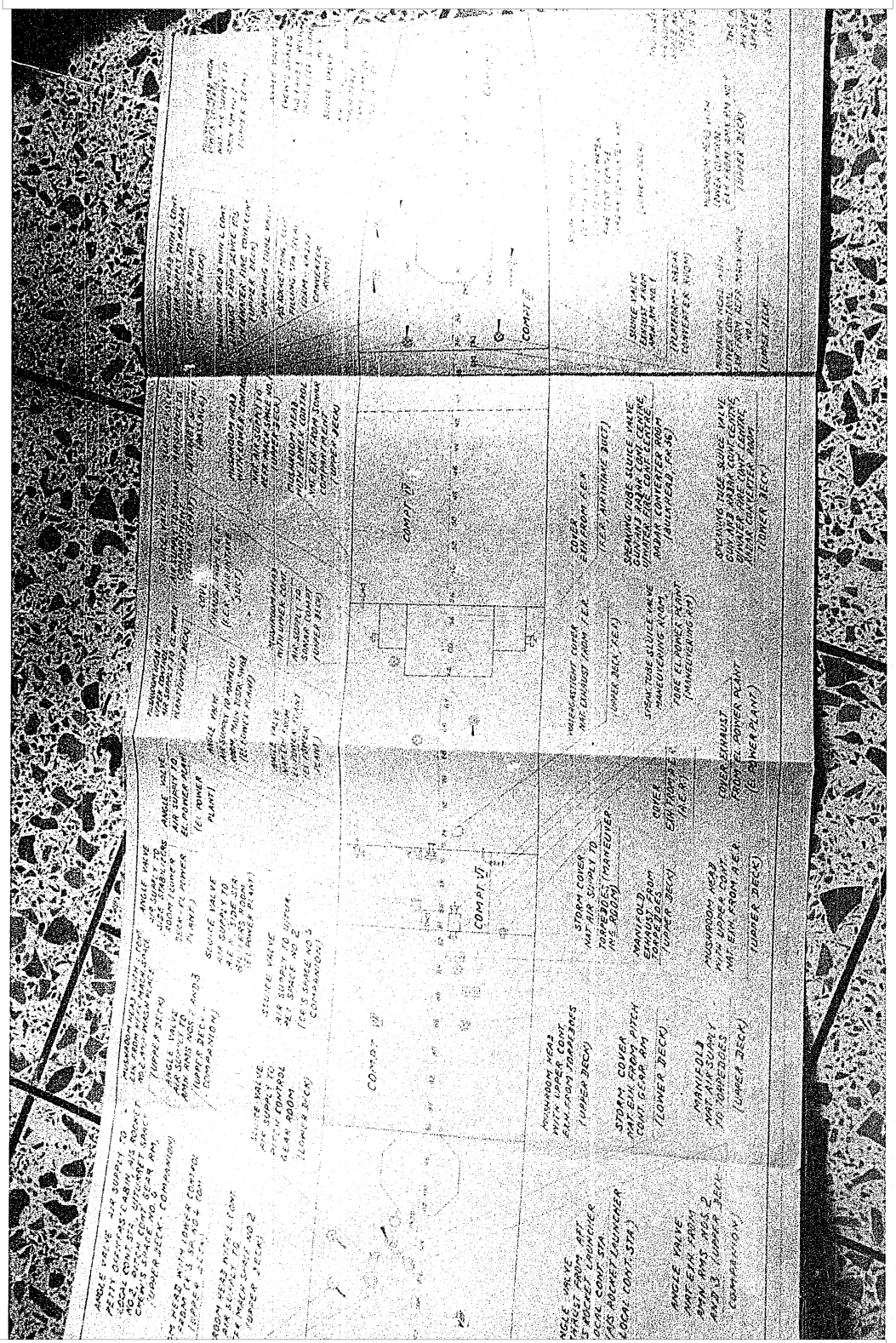

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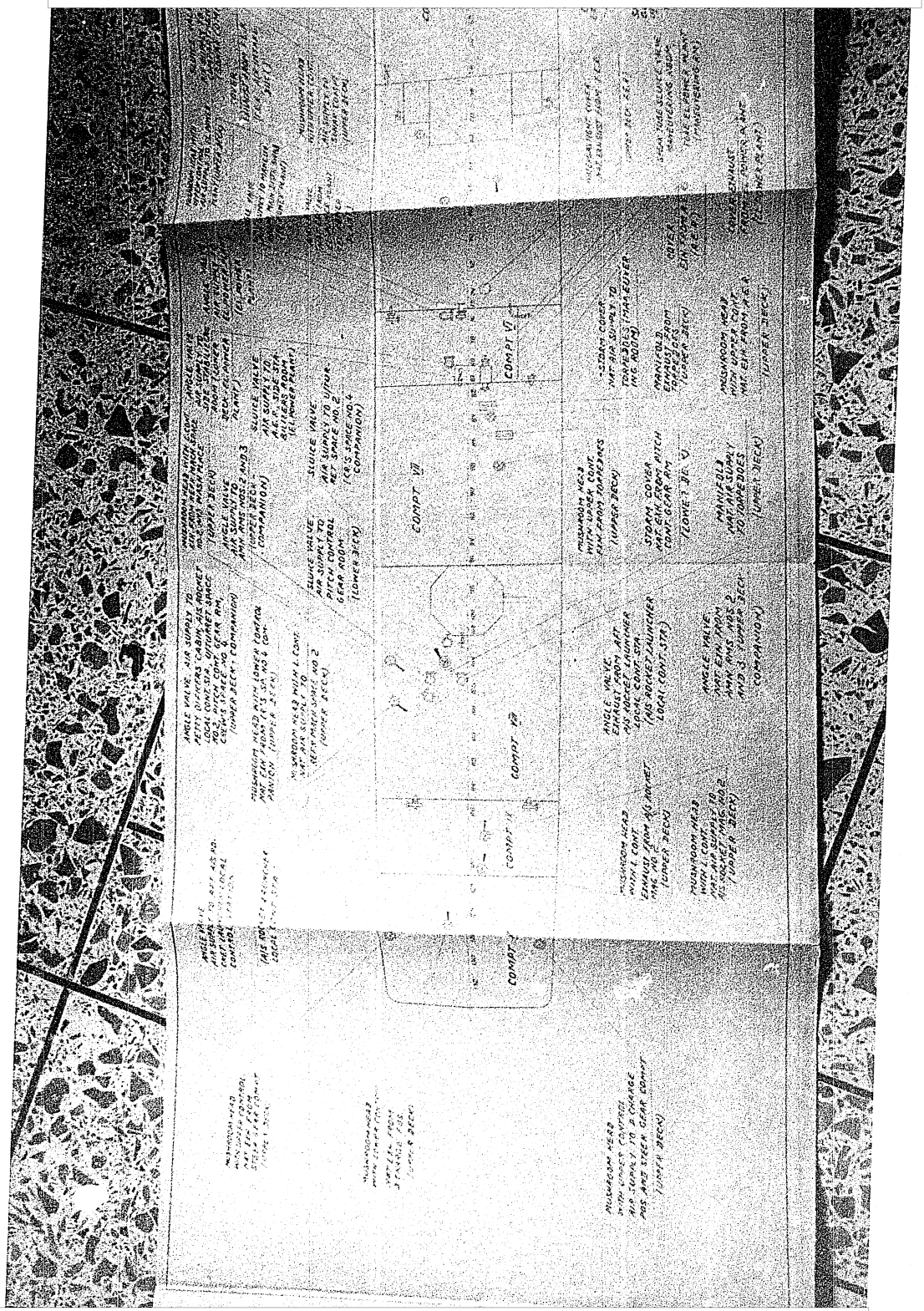

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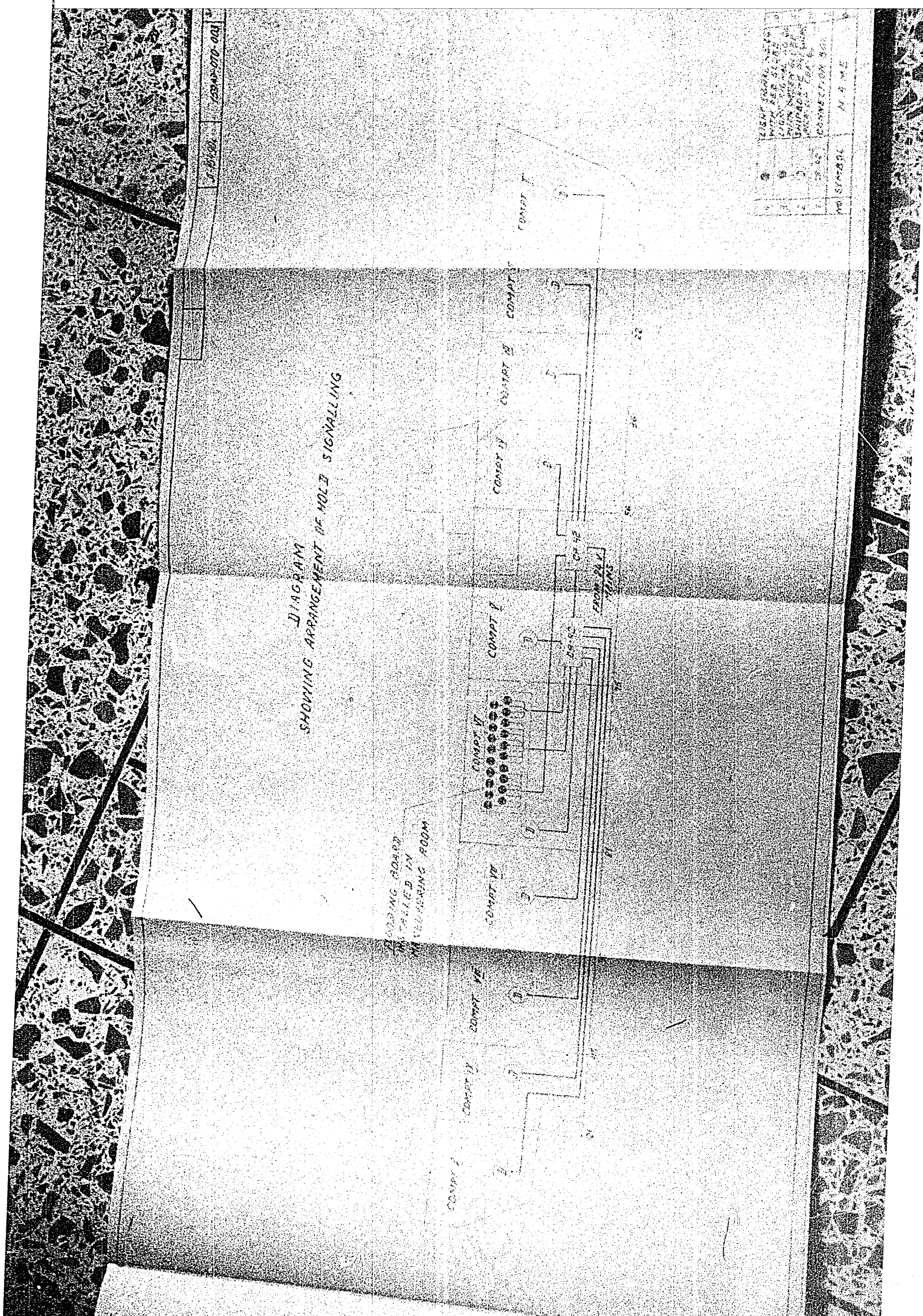

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Table

showing arrangement of openings in hull

Item No.	Purpose of opening	Location (frs.) Port	Location (frs.) Stbd	Size of opening, mm	Distance from upper deck over shell plating expansion, mm
1	2	3	4	5	6
1	To drop depth charges	transom	transom	830x660	1160
2	For Gear U-159A9	128	128	920x1100	2700
3	For steering shaft supporting tube	123	123	dia.520	5450
4	For flooding system kingston valve	-	121-122	dia.265	6875
5	For bilge system flap	121-122	-	dia.125	2500
6	For kingston valve of air cooling system	104-105	-	dia.265	7710
7	For ballast system kingston valve	104-105	-	dia.265	6800
8	For air cooling system valve	104-105	-	dia.103	1850
9	For side shafting stern tube	104-105	104-105	dia.425	5500
10	For ballast system valve	103-104	-	dia.125	2050
11	For drain valve of drainage tank	100-101	-	dia.83	2300
12	For main engine discharge kingston valve	-	94-95	Dia.220	6825

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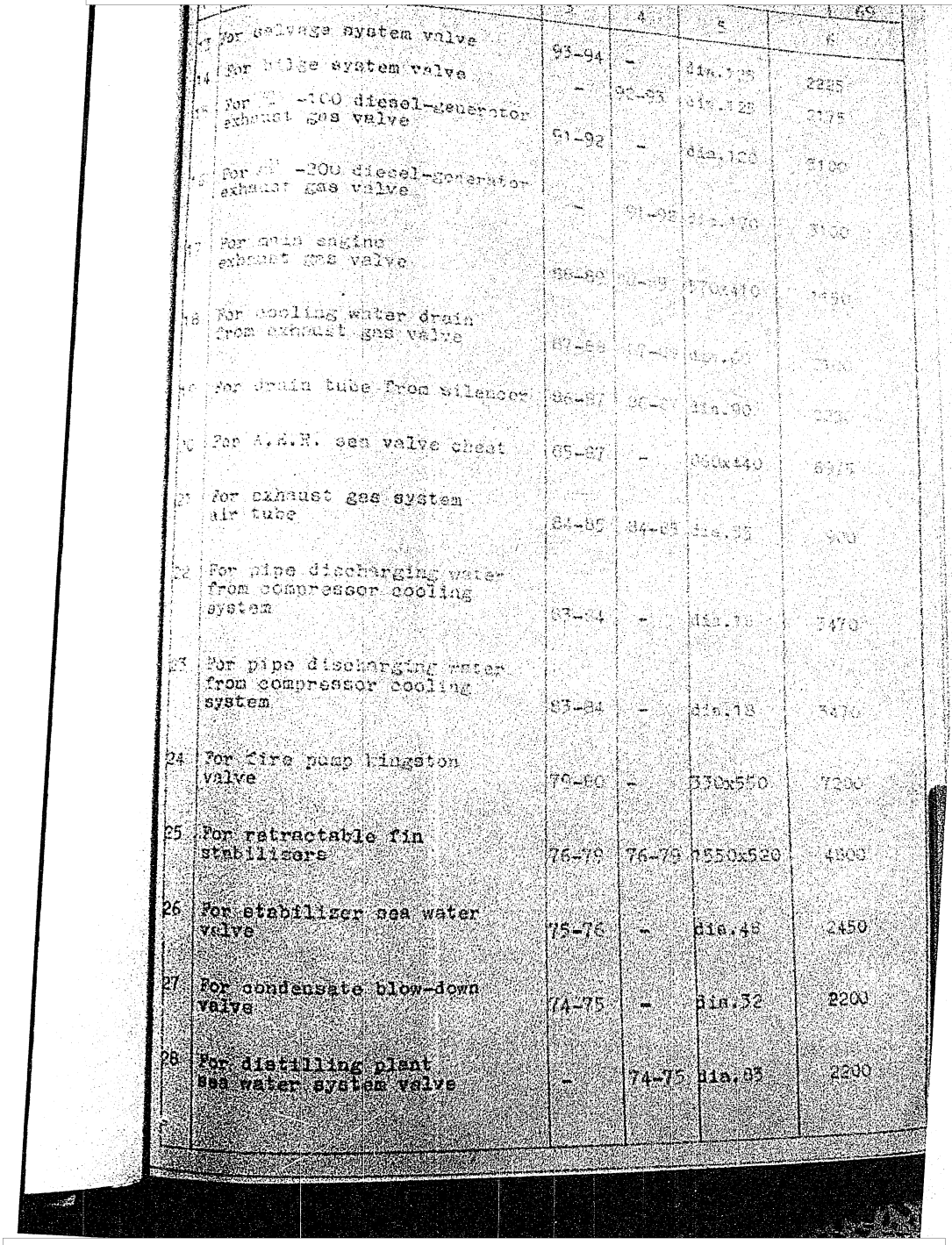

		3	4	5	6
13	For salvage system valve	93-94	-	dia.125	2225
14	For bilge system valve	-	92-93	dia.125	2175
15	For [illegible] -100 diesel-generator exhaust gas valve	91-92	-	dia.120	3100
16	For [illegible] -200 diesel-generator exhaust gas valve	-	91-92	dia.170	3100
17	For main engine exhaust gas valve	88-89	[illegible]	570x410	[illegible]
18	For cooling water drain from exhaust gas valve	87-88	[illegible]	dia.[illegible]	[illegible]
19	For drain tube from silencer	86-87	86-87	dia.90	[illegible]
20	For A.E.R. sea valve chest	85-87	-	860x440	6975
21	For exhaust gas system air tube	84-85	84-85	dia.55	900
22	For pipe discharging water from compressor cooling system	83-84	-	dia.18	3470
23	For pipe discharging water from compressor cooling system	83-84	-	dia.18	3470
24	For fire pump kingston valve	79-80	-	330x550	7200
25	For retractable fin stabilisers	76-79	76-79	1550x520	4800
26	For stabilizer sea water valve	75-76	-	dia.48	2450
27	For condensate blow-down valve	74-75	-	dia.32	2200
28	For distilling plant sea water system valve	-	74-75	dia.83	2200

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			4	5	6
[illegible]	For blowing down slush from distilling plant	-	73-74	dia.1[illegible]	[illegible]
[illegible]	For bilge system valve	70-71	-	dia.125	2375
31	For discharge kingston valve of gas turbine installation	68-69	68-69	200x130	4950
32	For pipe discharging water from compressor cooling system	-	66-67	dia.18	3100
33	For gas turbine installation suction kingston valve	65	65	190x130	7450
34	For ДГ -400 diesel-generator underwater exhaust	-	65	853x224	[illegible]
35	For ДГ -400 diesel-generator abovewater exhaust	-	65	220x215	2000
36	For F.H.R. sea valve chest	-	62-63	330x550	7525
37	For sewage system flap	60-61	-	dia.187	2300
38	For access to sonar dome	C.L.	C.L.	600x450	8700
39	For salvage system flap	-	56-57	dia.125	2587
40	For sewage system flap	55-56	55-56	dia.137	2650
41	For sewage system flap	55	-	dia.187	2650
42	For bilge system valve	-	54-55	dia.70	2675
43	For scuttle	52-54	52-54	dia.318	500
44	For antenna of fire control sonar	C.L.	C.L.	1650 x x 1250	8650
45	For antenna of scanning sonar	C.L.	C.L.	dia.1050	8630

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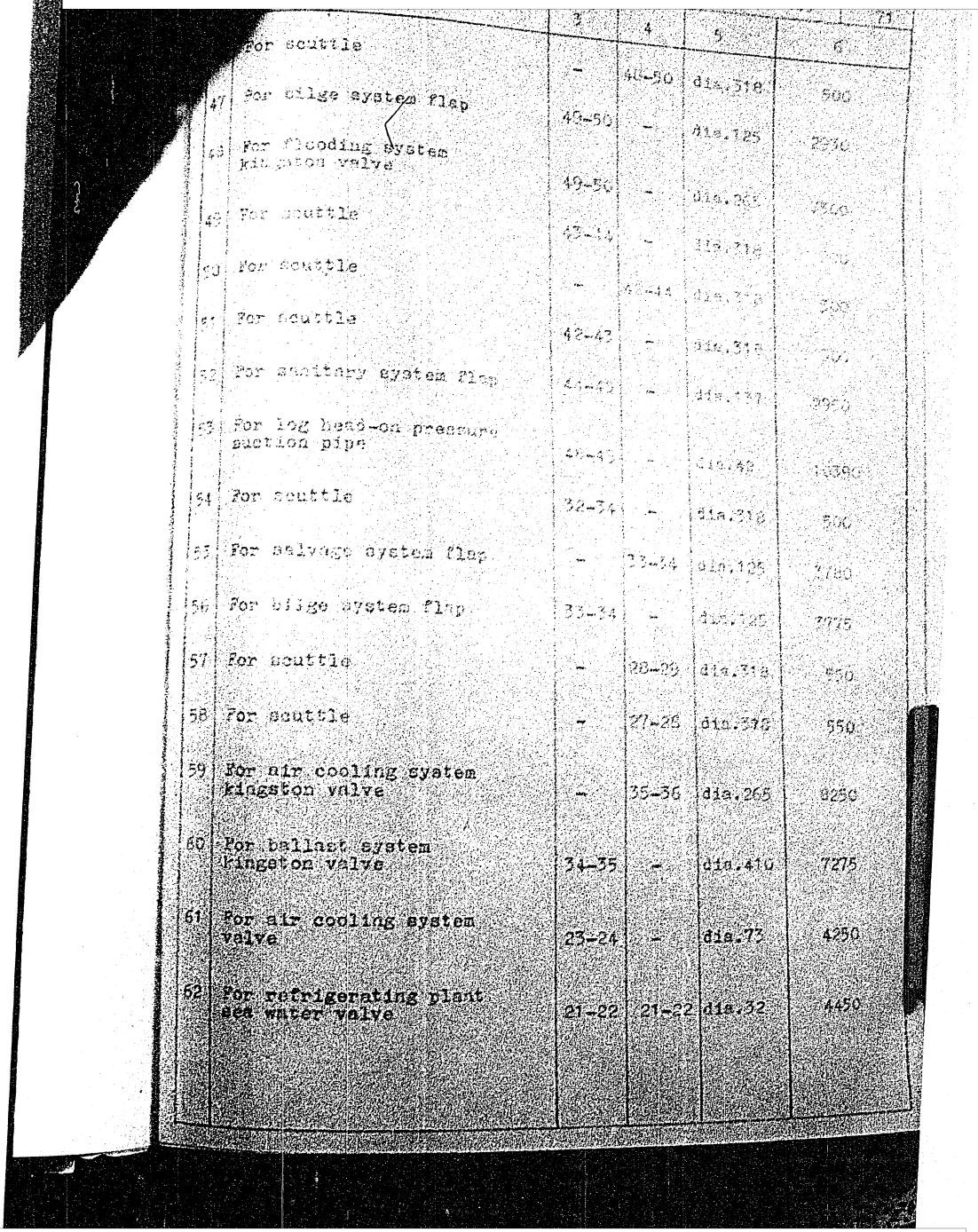

3	4	5	6
For scuttle	-	46-50	dia.318	500
47 For bilge system flap	49-50	-	dia.125	2550
48 For flooding system kingston valve	49-50	-	dia.265	7300
49 For scuttle	43-44	-	dia.318	500
50 For scuttle	-	43-44	dia.318	500
51 For scuttle	42-43	-	dia.318	500
52 For sanitary system flap	41-42	-	dia.137	2950
53 For log head-on pressure suction pipe	40-41	-	dia.42	1038
54 For scuttle	32-34	-	dia.318	500
55 For salvage system flap	-	33-34	dia.125	2780
56 For bilge system flap	33-34	-	dia.125	2775
57 For scuttle	-	28-29	dia.318	550
58 For scuttle	-	27-28	dia.318	550
59 For air cooling system kingston valve	-	35-36	dia.265	8250
60 For ballast system kingston valve	34-35	-	dia.410	7275
61 For air cooling system valve	23-24	-	dia.73	4250
62 For refrigerating plant sea water valve	21-22	21-22	dia.32	4450

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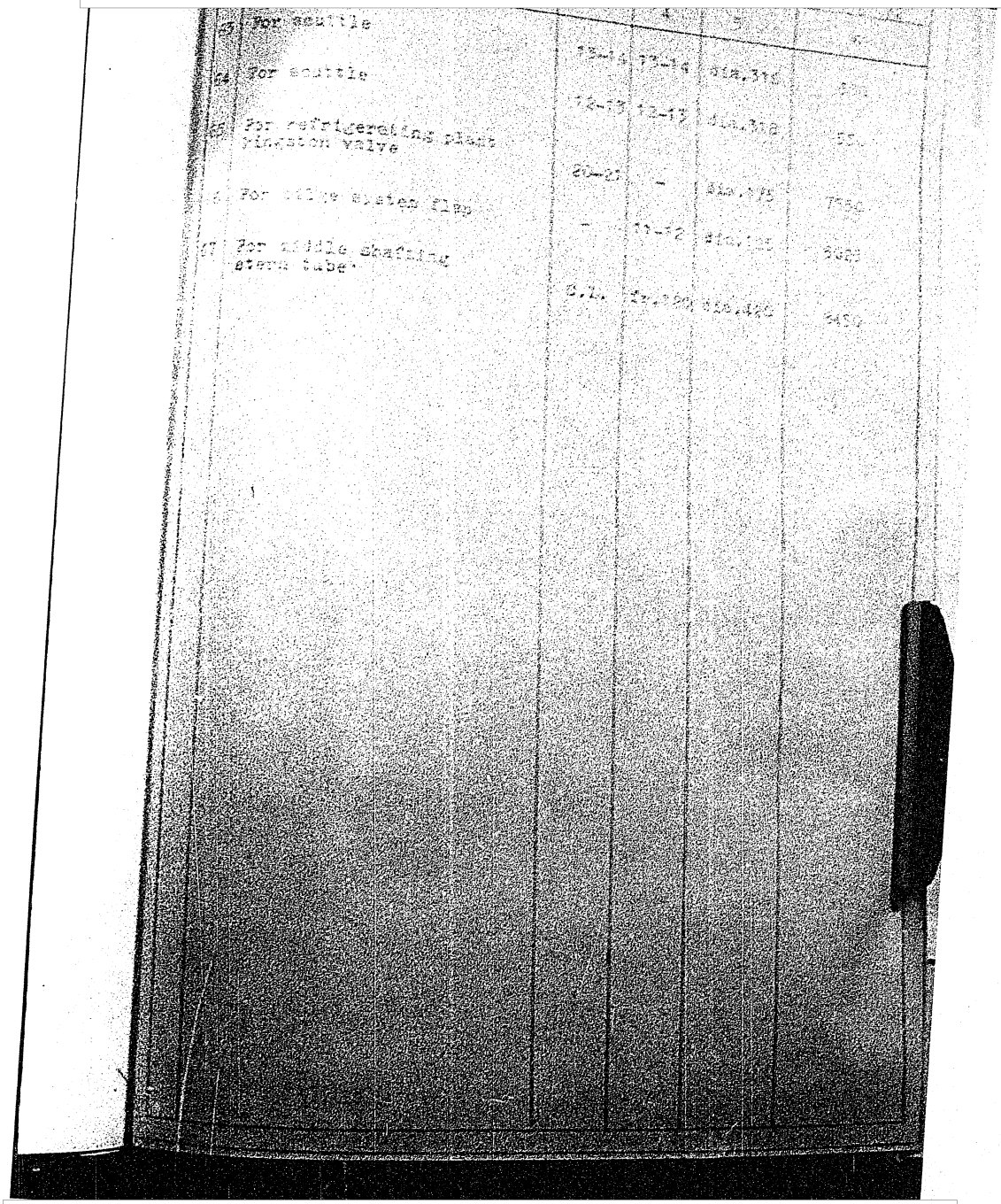

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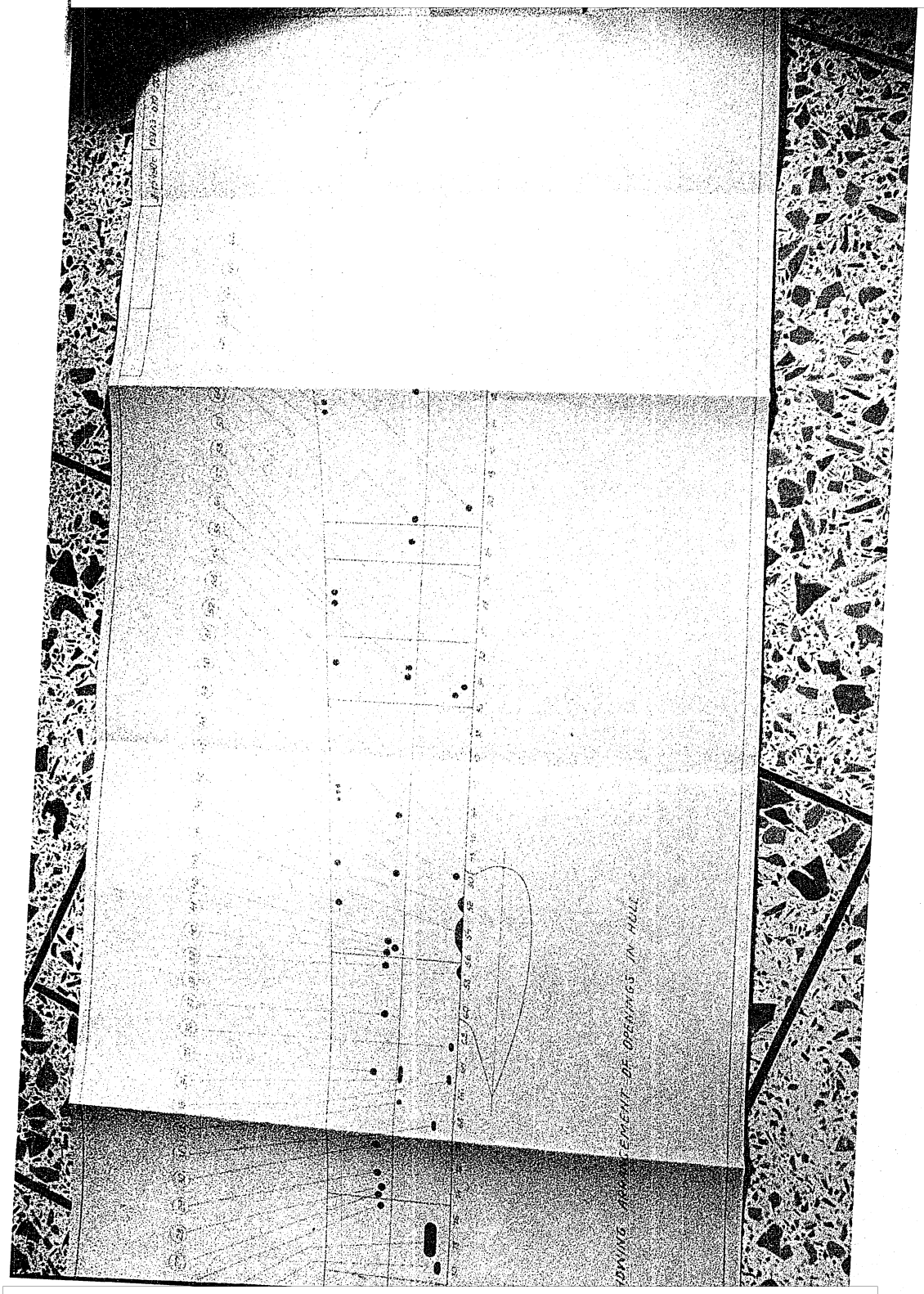

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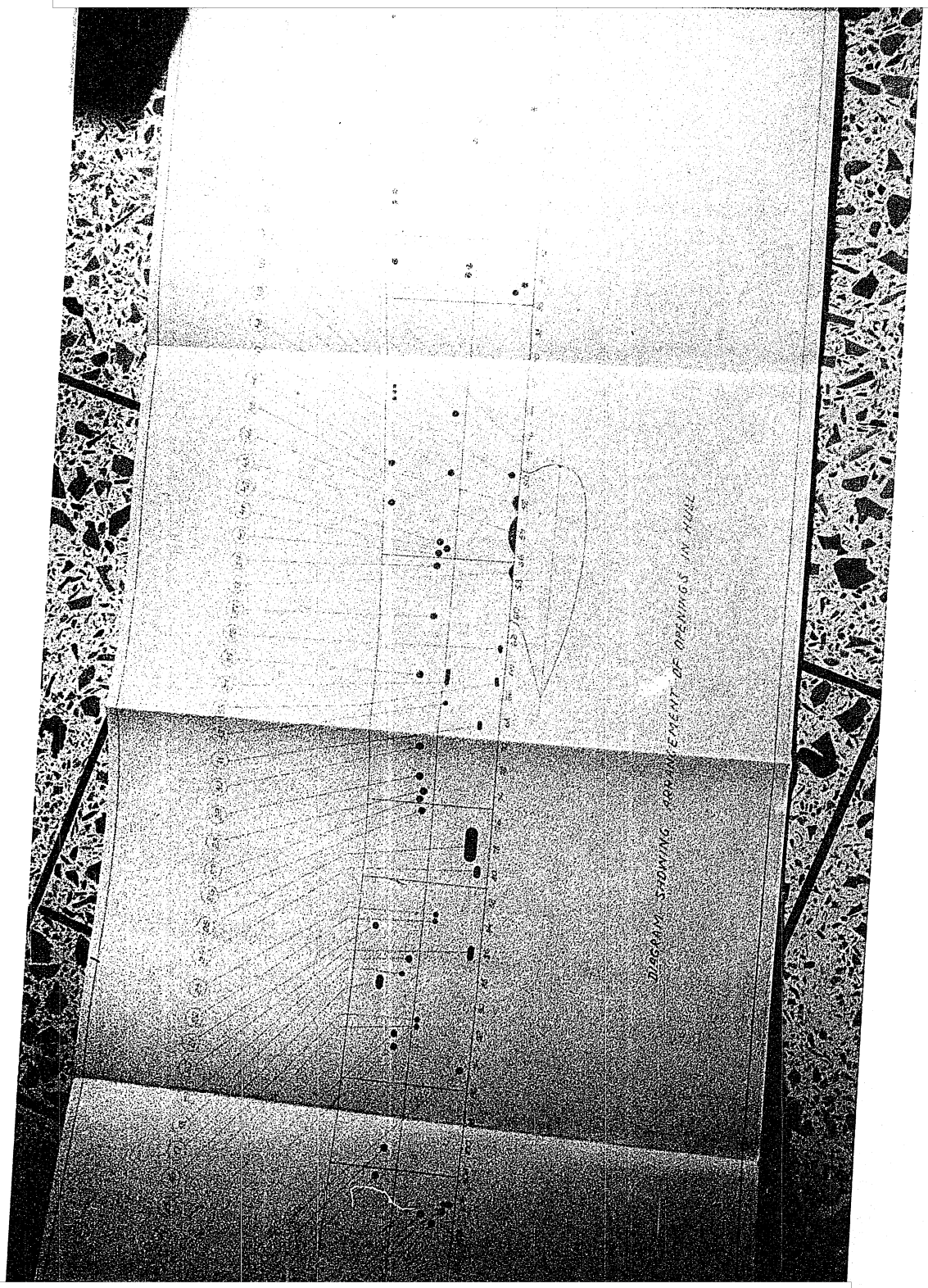

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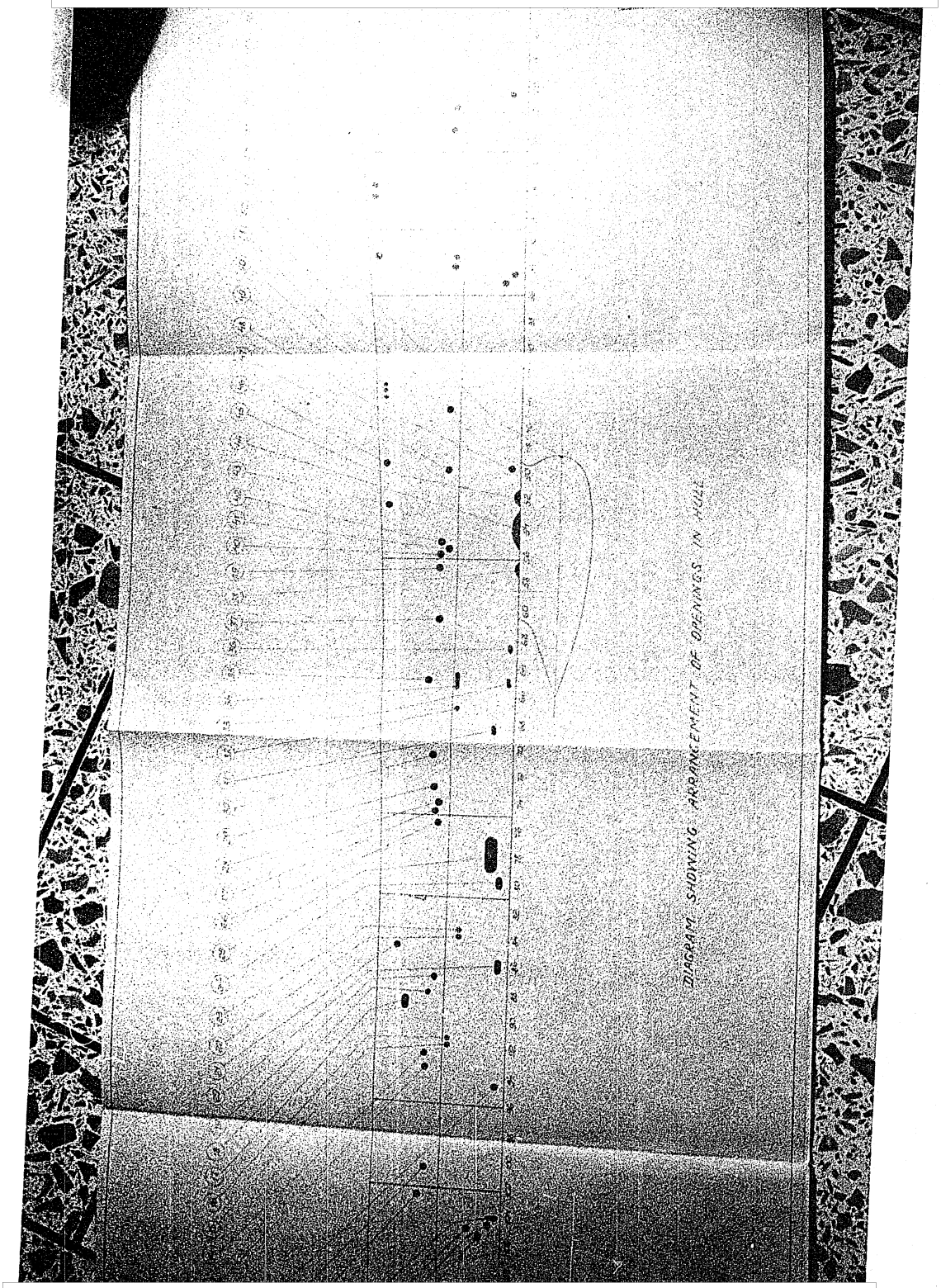

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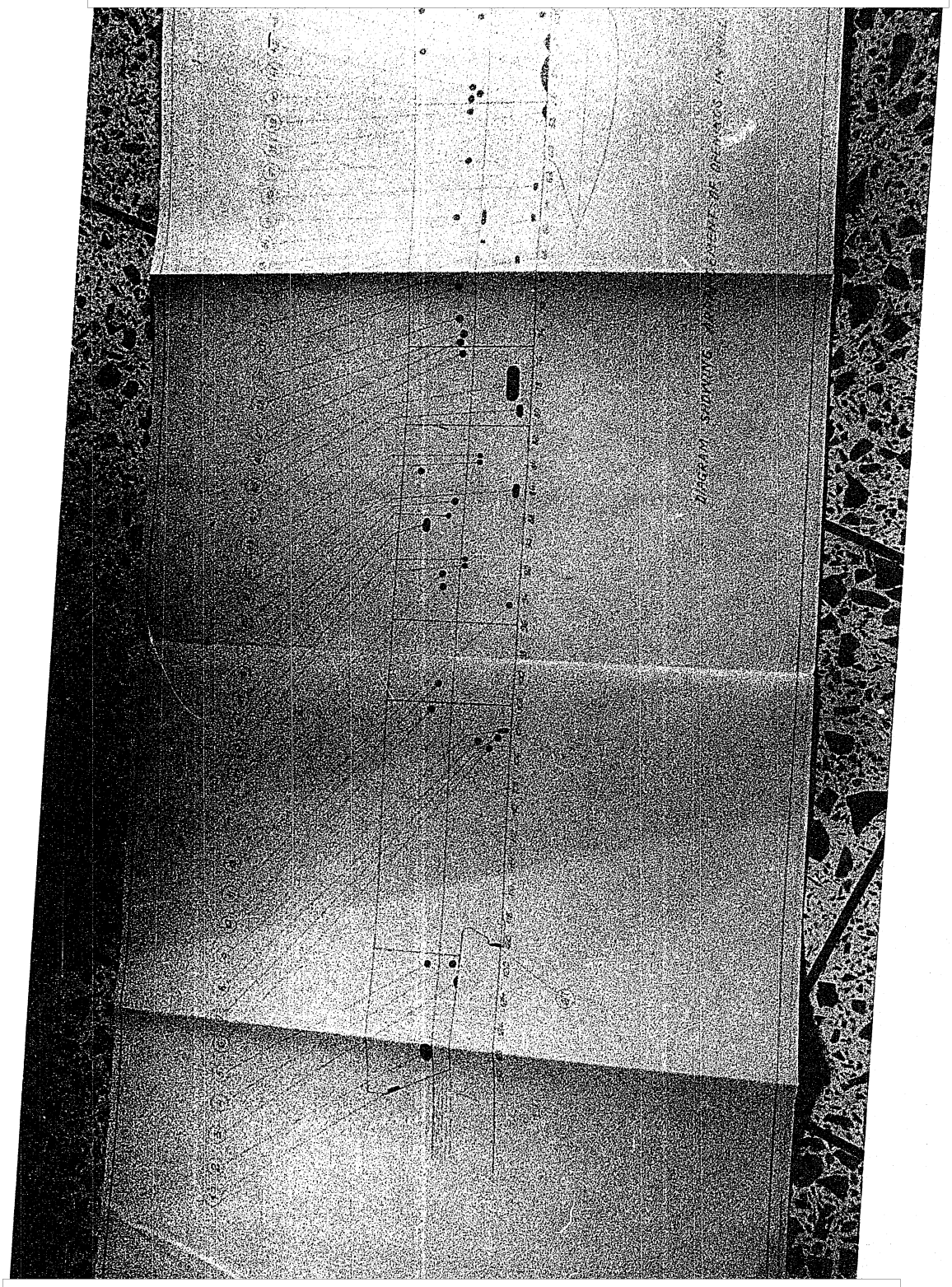

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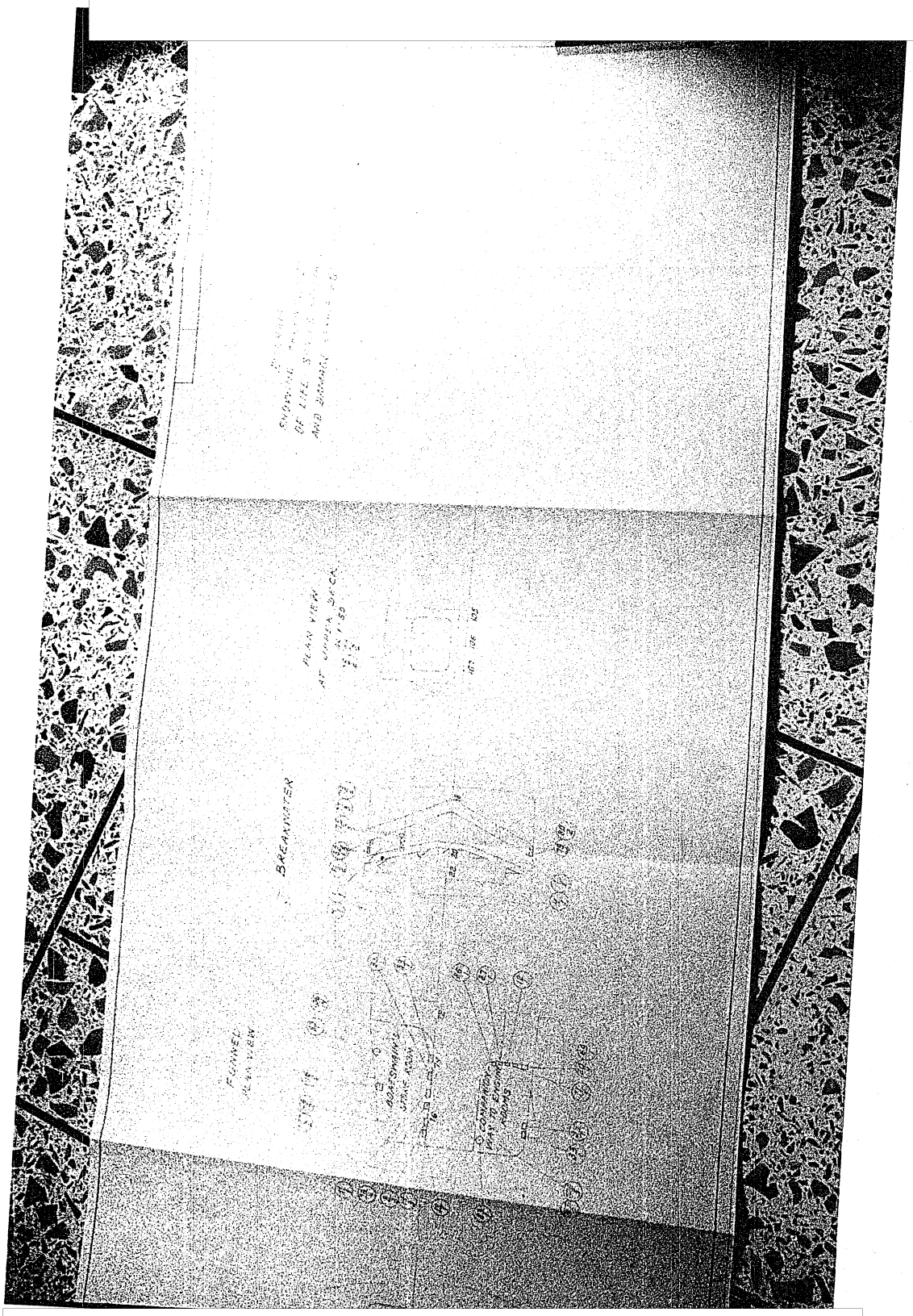

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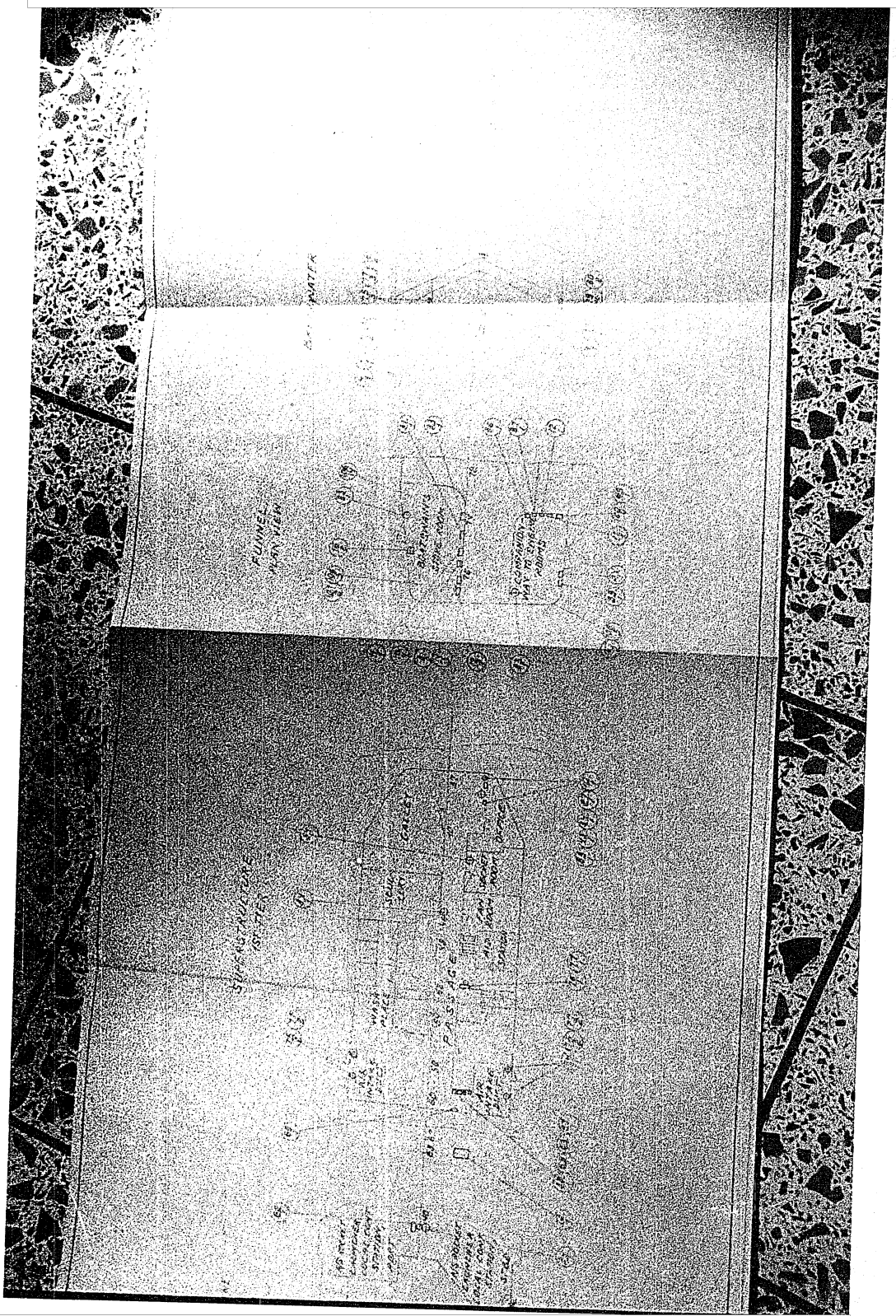

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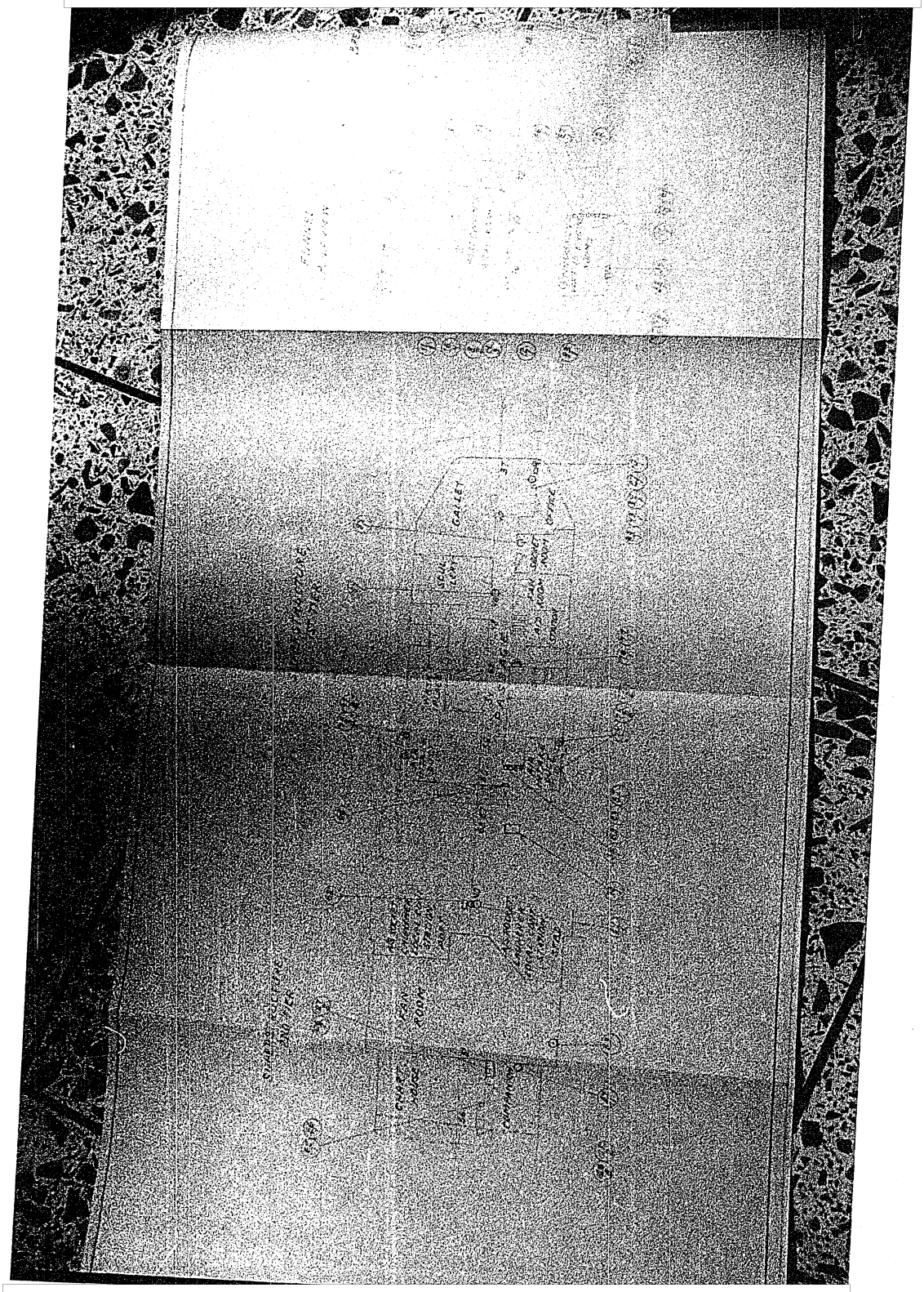

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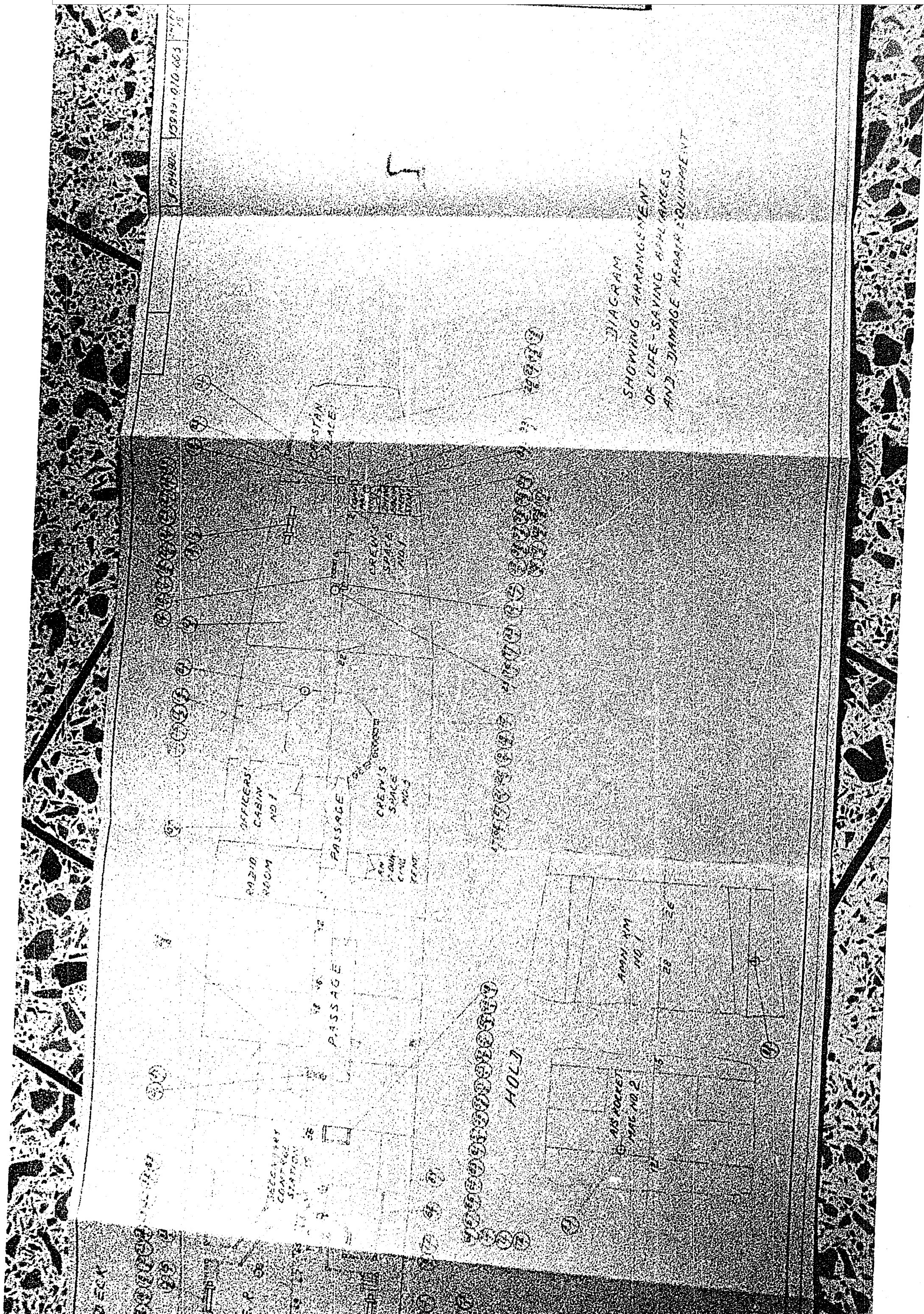

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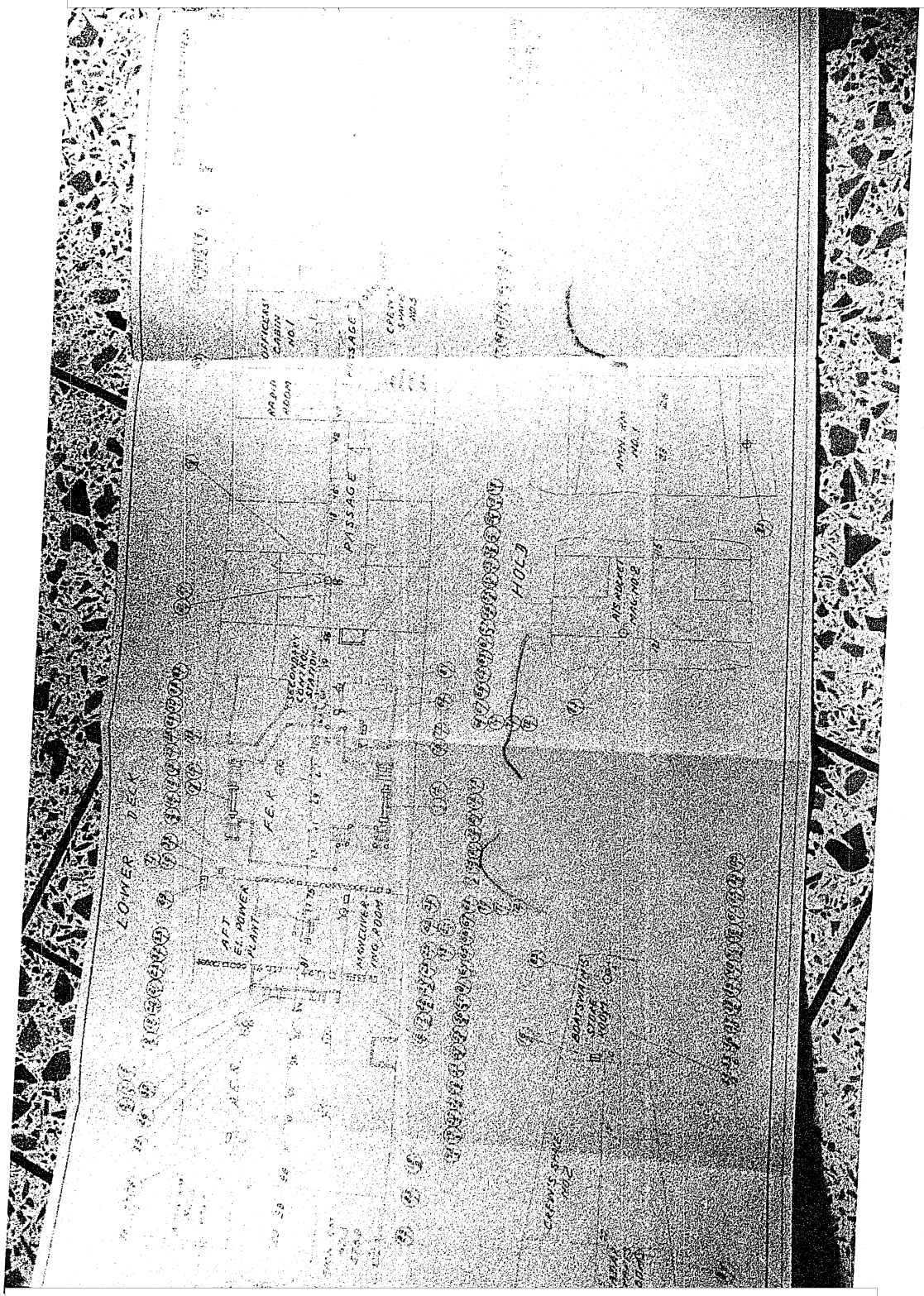

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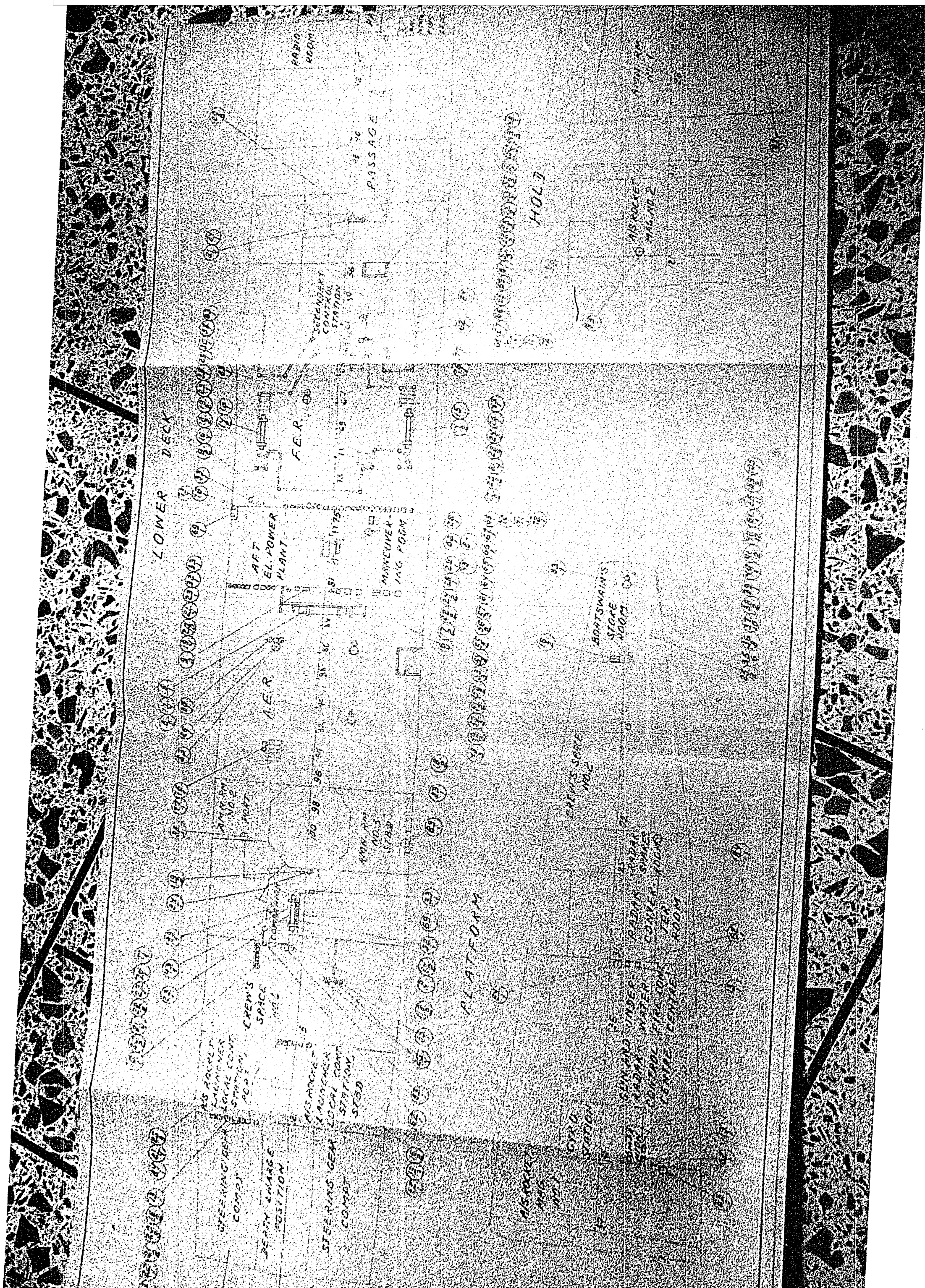

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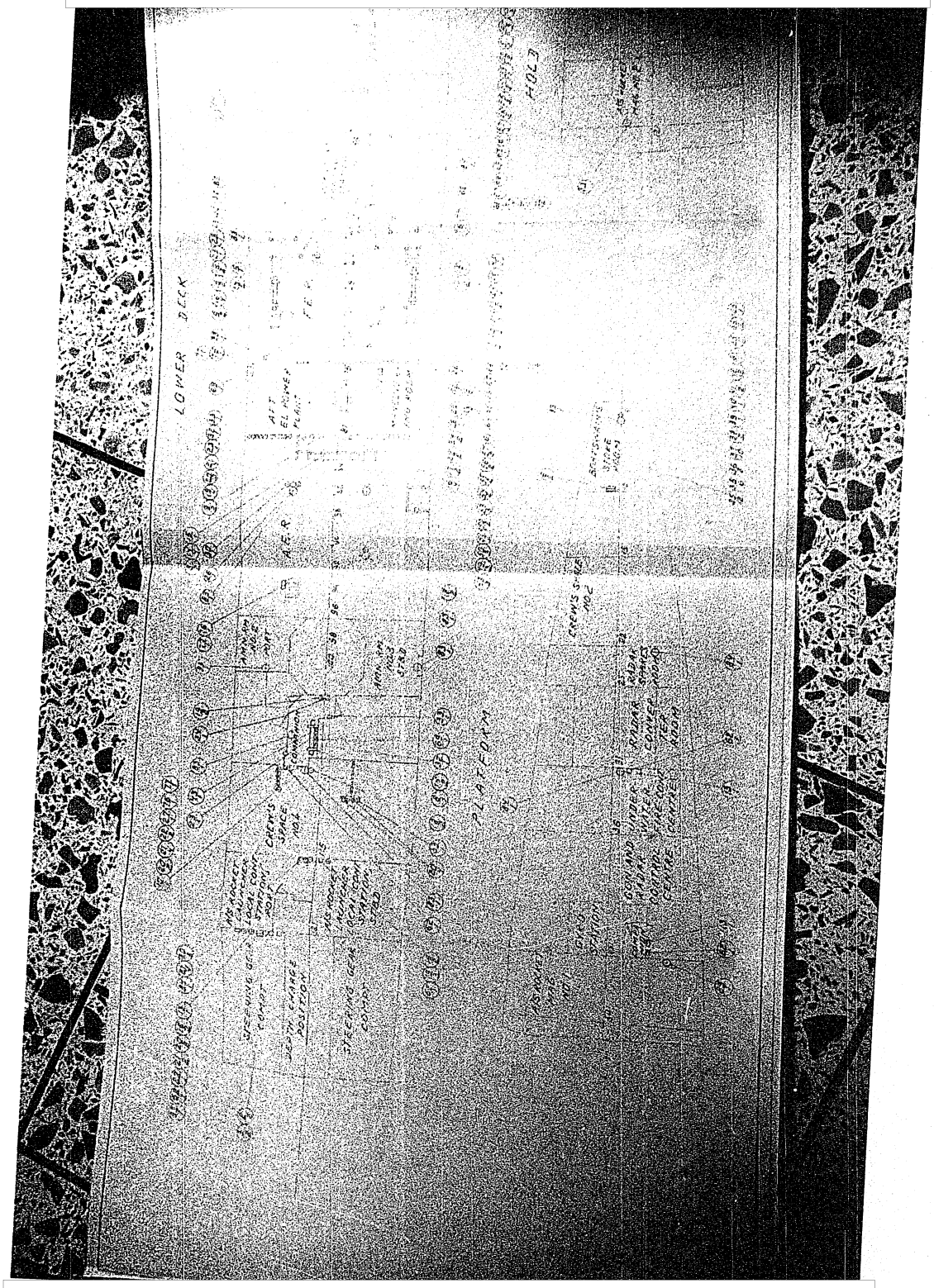

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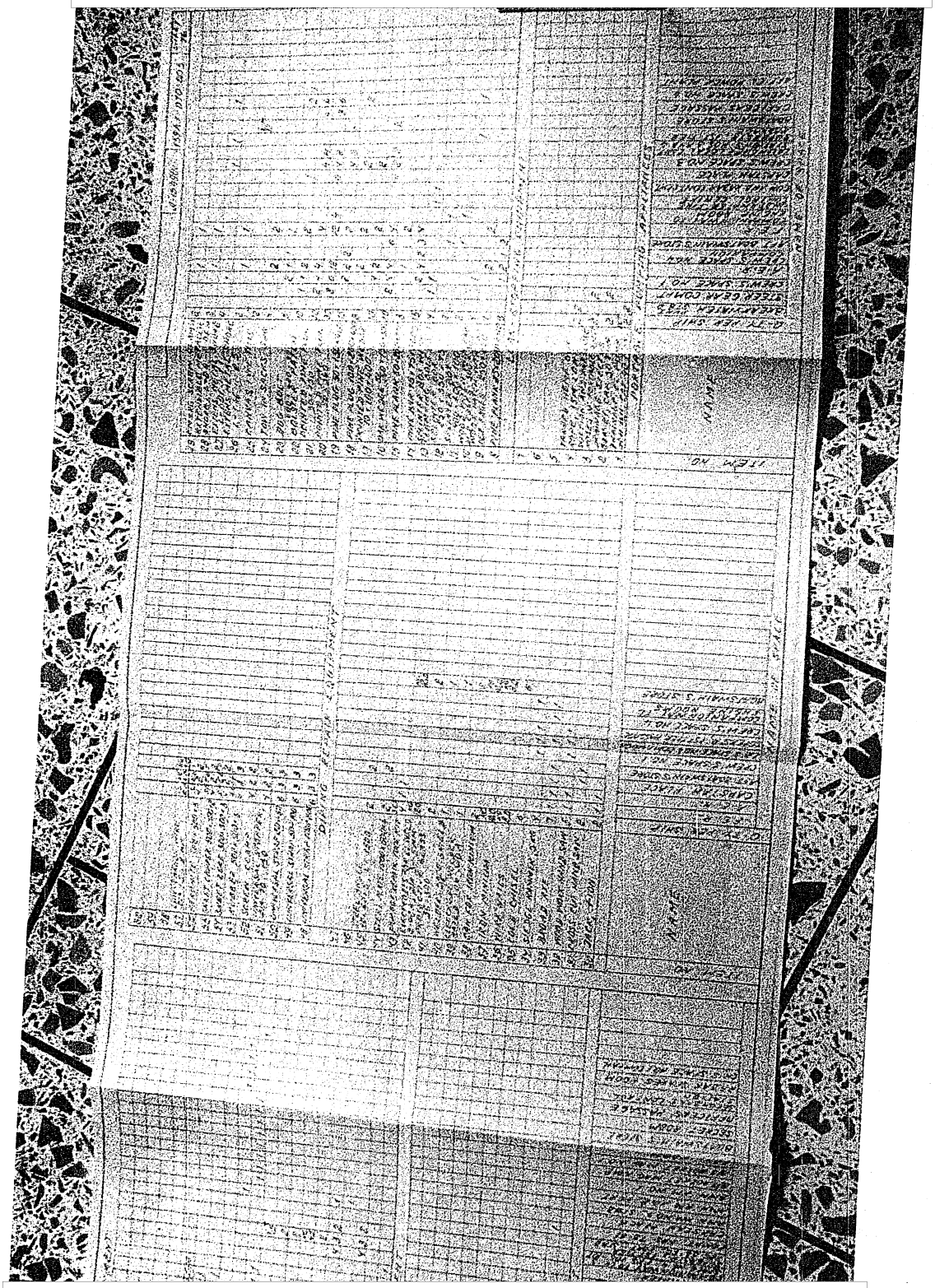

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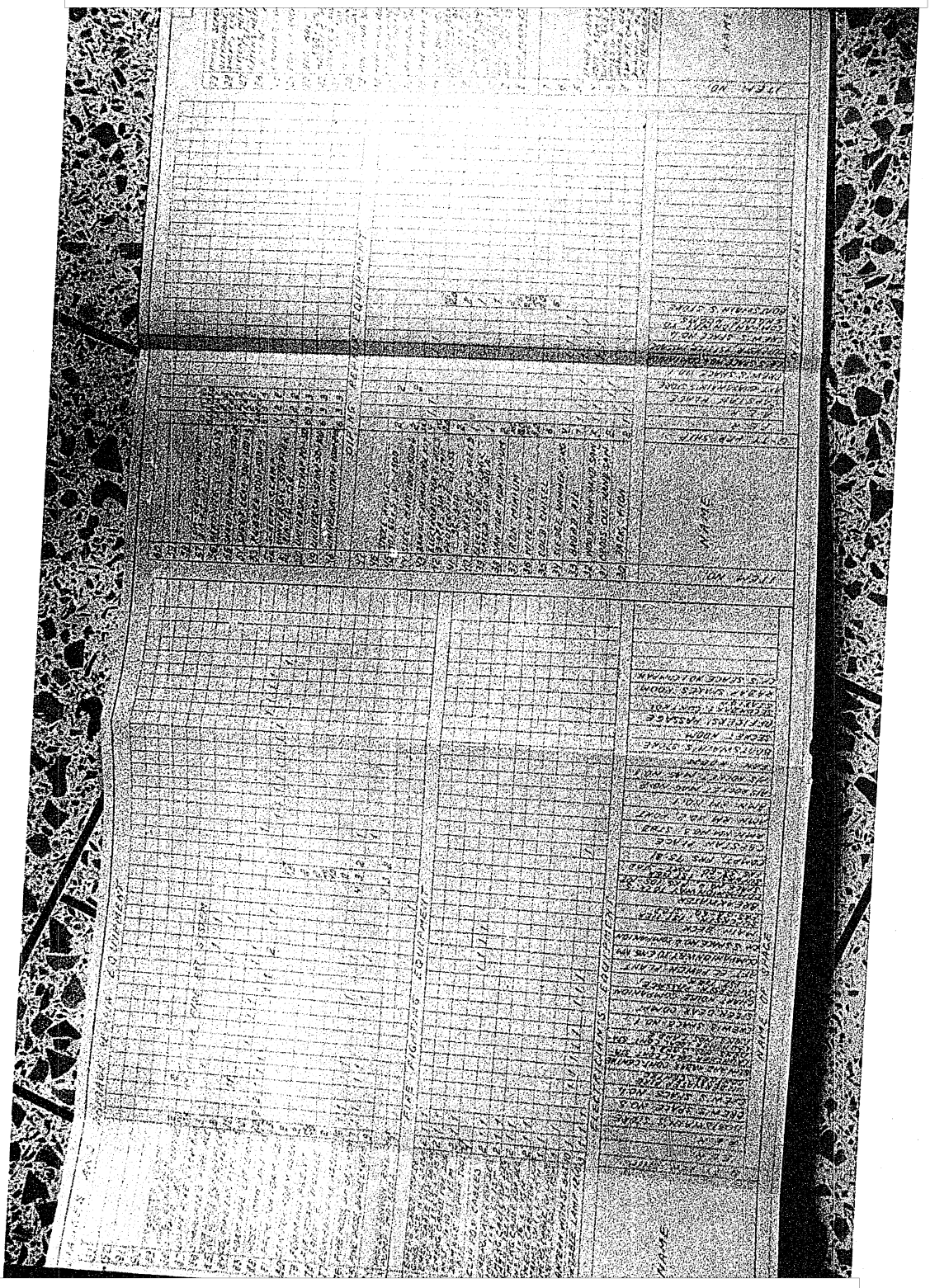

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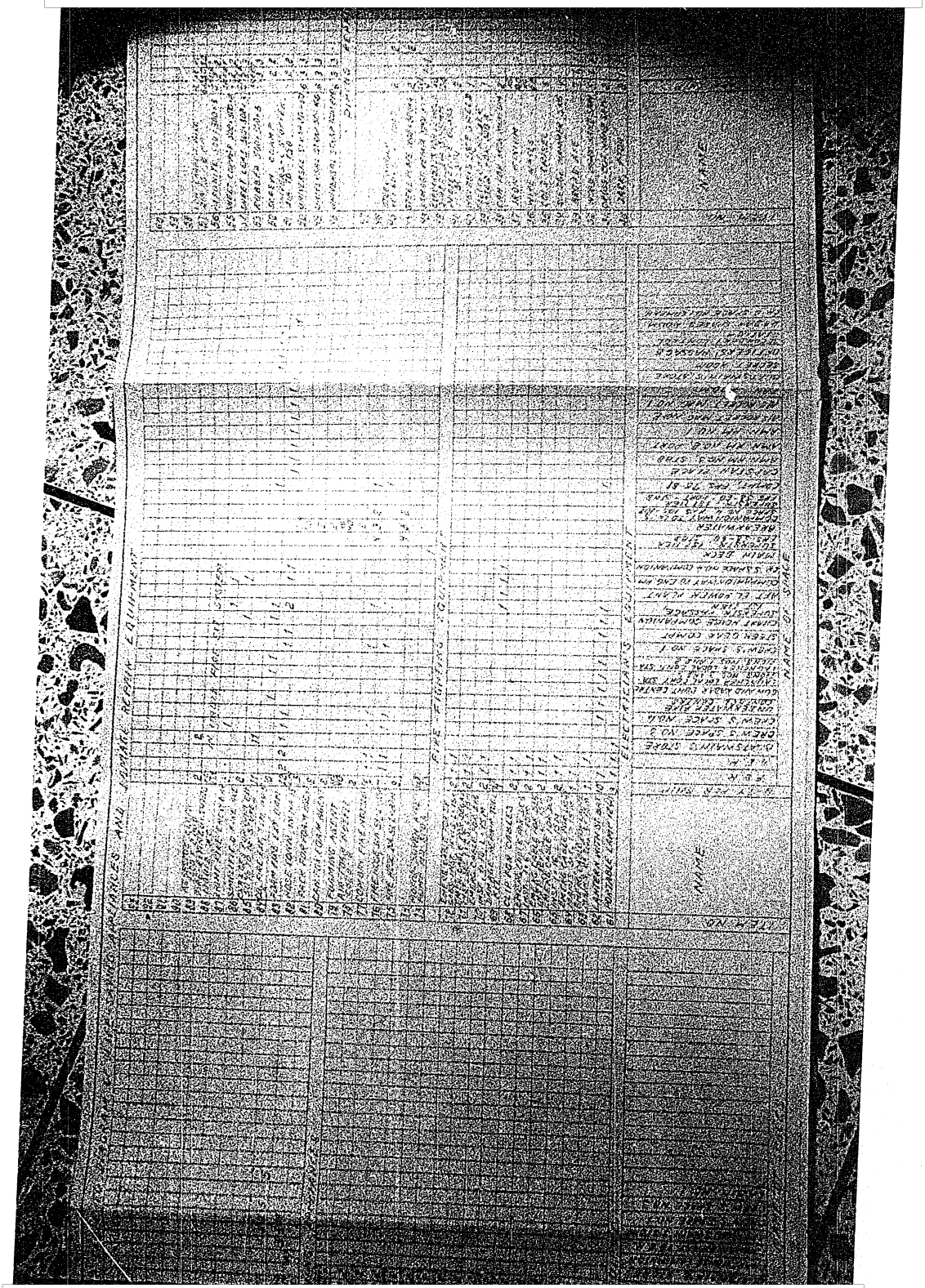

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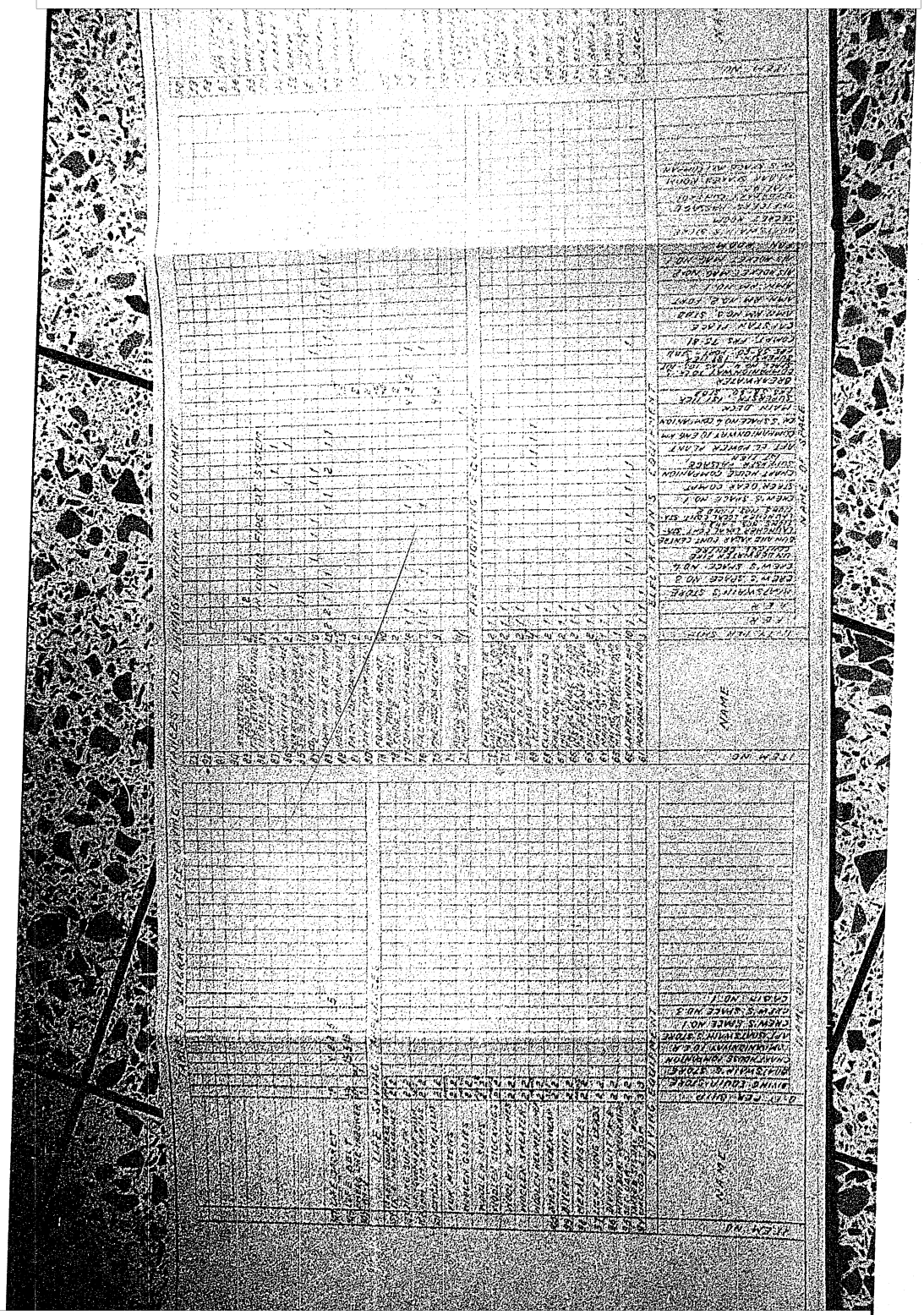

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